The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

VOL XXI. No. 529 AUGUST 17, 1929 Prepaid Annual Subscription: United Kingdom, £1.1.0; Abroad, £1.6.0

Contents

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

The prepaid subscription to THE CHEMICAL AGE *is 21s. per annum for the United Kingdom, and 26s. abroad. Cheques, Money Orders, and Postal Orders should be made payable to Benn Brothers, Ltd.*

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Telegrams: "Allangas, Fleet, London." Telephone: City 0244

Chemical Overseas Trade

CHEMICAL export trade has made a good start in the second half of the current year. The slight set-back in June, as we suggested would be the case, has proved to be merely temporary, and the complete returns for the seven months mark a distinct all-round advance on the 1928 figures. So far this year there has been an increase of £284,420 in chemical imports, an increase of £103,174 in chemical exports, and an increase of £6,445 in chemical re-exports. For the month of July alone, compared with July of last year, imports have increased £235,486, exports have increased £185,666, and re-exports have increased £447. The increases are very much more marked when comparison is made with the figures for 1927. The latest figures will strengthen the confidence which for months past British chemical industry has steadily been regaining.

Coming to the details of the July returns, the increase in imports is spread pretty generally over the whole range of products; incidentally, it includes the figure of £3,199 for intermediates against nothing in the corresponding month of last year. There are three rather notable cases of decrease—nitrate of soda, from £44,796 to £11,622; quinine and quinine salts, from £11,335 to £5,843; and extracts for tanning, from £105,975 to £55,236. The increase on the export side is mainly accounted for by extended business in sulphate of ammonia, sodium compounds, drugs, dyestuffs, and painters' colours. A weak point is disclosed in coal tar products, which have fallen from £248,377 to £154,763, while decreases have also occurred in ammonium chloride, bleaching powder, glycerine, and potassium compounds. The balance, however, is distinctly on the right side.

Creative Advertising

THE great International Advertising Convention which has been meeting in Berlin this week supplies impressive evidence of the immense influence that the organised science of advertising now exerts on the trade of every large nation, the high standards of modern advertising service, and the increasingly strict ethical principles that dominate the business. Taking these points in the reverse order, "Truth in advertising" has now become the recognised slogan. It is of no use, in short, to advertise as good products that are not good, or to use clever devices to gather in orders that will only result in dissatisfied customers. The advertising experts are all dead against it. Secondly, it is recognised that advertisements drawn up anyhow and by anybody who has nothing else to do are largely a waste of time and money. In the early days of the business, if one glances over our great daily journals, it was common to think of the editorial matter as "literary" and the advertisement side as merely "the shop." To-day almost the reverse is the case. The editorial style in the more popular productions has visibly cheapened, while the advertising notices approach the level of real literature and art. Only the best, in fact, is good enough, and it is the best, the most persistent, and the best organised advertising that pays and pays handsomely.

There has thus come into existence a new and powerful agency for the improvement of trade—by what? By educating people into a buying habit, by creating new demands and therefore more industries, by raising, as Sir Ernest Benn put it, the whole standard of life. More than one great industry has been created by someone who saw an easy way of adding some comfort or luxury to existence or of obviating some troublesome or wasteful task. The moment the remedy is offered the public welcome it, and a new business comes into being. In the purely industrial and chemical engineering field, the same thing has repeatedly happened in labour-saving devices, in synthetic substitutes for natural products, in the utilisation of what were formerly waste products, in the substitution of short cuts for laborious and complicated processes, in the production of lighter,

more suitable, less corrodible metals, and so on. And it is the function of good advertisement to bring these new ideas to success by finding customers for them in the markets of the world. Thus industry has come to recognise that advertising, instead of being a luxury to be tacked on at the end of a business that can afford it, or a nuisance into which the producer is forced reluctantly by persuasion or competition, takes its place among the first essentials of sale and distribution, among the first and most productive charges on industry.

The growth of power in the advertising field has been accompanied, too, by a corresponding growth of responsibility for its proper use. The outlook of the leading speakers at the Berlin conference was not confined to devices for making money. Lord Riddell's presidential address was a statesmanlike plea for the freest possible flow of trade between nations. Mr. W. Harrison's contribution on the rationalisation of industry was on much the same level. It was left to Sir Ernest Benn to state the true philosophy of advertising, as the means of raising the standard of civilisation, by both creating needs and satisfying them, and so developing and multiplying industries. Advertisement, understood in the right sense, is no longer a troublesome tax on trade; it has become the life-blood of industry.

The German Chemical Industry

THERE has just been published an official analysis of German chemical industry in 1928, in which a relation is deduced between total share capital and total dividends paid. Only those companies are considered at least three-quarters of whose financial year fell in 1928. In 1927 the number was 115, which fell, owing to various fusions, to 112 in 1928. In view of the outstanding position of the I.G., the calculations are made both with and without including its operations, while similar allowance is made for the artificial silk producers.

In general, the year 1928 was somewhat more favourable for Germany than former years. The fact is pointed out that, as was known before the war, the chemical industry is one of those branches of industry which are comparatively little affected by economic depressions and crises. In the last few years the percentage of German chemical companies not paying a dividend has been as follows: 1925, 7.0 per cent.; 1926, 55·8; 1927, 28·9; 1928, 20·5. The average dividend paid, the I.G. and the artificial silk producers being included, is as follows:—1925, 6·6 per cent.; 1926, 6·6; 1927, 9·4; 1928, 9·9. If the I.G. and the artificial silk producers are left out, the dividends are:—1925, 3·1 per cent.; 1926, 3·7; 1927, 6·8; 1928, 7·1. These latter figures are regarded as indicating that, the I.G. and artificial silk producers excepted, the German chemical industry is giving a return below that which is normally expected at the present time. The writer of the German article puts the normal safe dividend at 8-9 per cent., and considers that in view of the high risks of the chemical industry, the returns are too small.

In order to indicate the great significance of exports for the dividend-earning power of the German chemical industry, the following figures for the total value of exports of chemical products from Germany may be quoted: 1925, 937 million marks; 1926, 1,020 million; 1927, 1,162 million; 1928, 1,318 million. These figures show a steady increase, and it is thought that this tendency will continue in the present year, for the value for the first half of 1929 was 709 million marks as against 623 millions in the first half of 1928.

The B.B. Jubilee

THIS week the firm of Benn Brothers, Ltd., enters on its jubilee year. It is appropriate evidence of its steady growth and stability that in its 49th year it is able to declare the highest dividend in its long career, 20 per cent. That event, however, is not spectacular, but incidental; the conservative policy in the past of spending profits on purchasing new properties, erecting the fine Fleet Street premises known as Bouverie House, and extending its services to customers, leaves it in a position to allocate a little more to the shareholders. One most gratifying feature of the firm's progress is that the various industries represented by the firm's many trade and technical journals have enjoyed corresponding prosperity—a pleasant illustration of the theory, expounded by Sir Ernest Benn to the Berlin Congress on Wednesday, that advertising publicity is one of the first essentials of business prosperity and expansion.

Books Received

DIE RIECHSTOFFE UND IHRE DERIVATE. VOL. I. ALDEHYDE DER ALIPHATISCHEN REIHE. Edited by Dr. Alfred Wagner. Vienna: A. Hartleben's Verlag. Pp. 404, unbound. RM25.

HANDBOOKS OF THE SCIENCE MUSEUM: INDUSTRIAL CHEMISTRY. Compiled by A. Barclay. London: H.M. Stationery Office. Pp. 83. 1s.

VOLUMETRIC ANALYSIS. By Dr. I. M. Kolthoff and Dr. Ing. H. Menzel. London: Chapman and Hall, Ltd. New York: John Wiley and Sons. Pp. 552. 25s.

INDUSTRIAL FURNACE TECHNIQUE. By A. Hermansen. London: Ernest Benn, Ltd. Pp. 293. 25s.

CRYSTAL STRUCTURE AND CHEMICAL CONSTITUTION. A General Discussion held by the Faraday Society, March, 1929. London: Gurney and Jackson. Pp. 170. 8s. 6d.

FINANCIAL, INDUSTRIAL AND COMMERCIAL CONDITIONS IN CANADA, to April, 1929. By F. W. Field. London: H.M. Stationery Office. Pp. 98. 3s.

SIXTY-FIFTH ANNUAL REPORT ON ALKALI, ETC., WORKS. By the Chief Inspectors. Proceedings for the year 1928. London: H.M. Stationery Office. Pp. 31. 1s.

PHYSICAL CHEMISTRY. By Dr. J. B. Firth. London: W. B. Clive, University Tutorial Press, Ltd. Pp. 292. 5s. 6d.

BETRIEBSMITTELKUNDE FUR CHEMIKER. By M. Dolch. Leipzig: Otto Spamer. Pp. 336. RM20.

EVERYDAY CHEMISTRY. By Professor J. R. Partington. London: Macmillan and Co. Pp. 668. 7s. 6d.

SPECIAL REPORTS ON THE MINERAL RESOURCES OF GREAT BRITAIN. Vol. XXXI. BALL CLAYS. By Alex. Scott, M.A., D.Sc., F.R.S.E. London: H.M. Stationery Office. Pp. 73. 2s. 6d.

The Calendar

Sep. 9–12	Institute of Metals: Autumn Meeting.	Düsseldorf.
Nov. 8	Annual Chemical Dinner.	Connaught Rooms, London.

Ball Clays: Their Nature and Uses

Geological Relations, Mineral, Chemical and Physical Properties

As Volume XXXI of its special reports on the mineral resources of Great Britain, the Department of Scientific and Industrial Research has issued a monograph on "Ball Clays," by Dr. Alex. Scott (H.M. Stationery Office, pp. 73, 2s. 6d.) The general scope of the book is indicated below.

THE term "ball-clay" is applied to those plastic "transported" clays which, when fired in an oxidising atmosphere to the temperature of certain pottery ovens—approximately 1,150°-1,200° C.—have a white or nearly white colour. The name is somewhat unfortunate, as it does not refer to any particular property of the clay, but is derived from the original method whereby the clay was obtained in Dorset and Devonshire; by cutting it on the floor of open pits, into cubes or "balls," the sides being about 10 inches across and the weight 30–35 lbs.

Origin

Like many other clays, these are formed by the decomposition of felspathic rocks, by natural agencies. In this decomposition, silicates such as the felspars break down, and the products ultimately undergo hydration with the formation of the hydrated silicate of aluminium, kaolinite, and, in many cases, mixtures of hydrated oxides. Where these products are found resting in the parent rock, the clays are termed residual; where they have been transported and deposited elsewhere, they are known as transported clays. The China Clays of Cornwall are typical examples of the former; the ball clays to be discussed in this memoir are characteristic examples of the latter.

The two types differ in one important respect; the residual clay contains the undecomposed constituents of the parent rock; for example, in the case of China Clay, the quartz and the mica; the transported material, on the other hand, has undergone a variable amount of natural "sorting." By sedimentation, the coarser particles, such as quartz, have been eliminated to a certain extent during the transportation of the clay from its place of origin to its present site. The result is a concentration of the fine "secondary" materials, especially the "clay substance," and this concentration may proceed to such a degree that the total amount of "non-clay" matter may be very small.

Content of Iron

On the other hand, if the parent rock contains a fair proportion of iron-bearing minerals, these are liable to decompose, the iron compounds being converted to colloidal ferric oxide, which, being of a grain-size comparable with that of the clay, is carried with the clay and deposited at the same time. Such iron oxide, if present to the extent of more than one per cent., will often prevent the clay from burning to a white colour; other things being equal, the greater the content in iron oxide, the farther removed from white will be the colour of the fired material, although this colour is liable to be modified by the presence of lime or magnesia, as well as by the grain-size and distribution of the iron oxide.

It will be obvious, therefore, that the formation of large deposits of white-burning transported clays requires certain conditions; a parent felspathic rock low in iron, such as granite; the kaolinization of that granite to provide a bulk of clay substance; the transportation of that material in such a way that natural sorting ensues, so that the beds of clay are distinct from those of the heavier and coarser materials; and the deposition of the material under such conditions that contamination by other agencies does not occur. Many marine clays, for example, are rendered impure by the presence of shells and other hard parts of organisms, while other clays have undergone contamination by the precipitation *in situ* of marcasite or siderite from percolating waters.

British Deposits

In Great Britain, there are only three deposits of ball clay of a size sufficient to be worked as a source of white-burning clay. One of these is in Dorset, in the neighbourhood of Wareham, one in South Devon, near Newton Abbott, and the third in North Devon, near Petrockstow, to the south of Torrington; the main shipping ports from which the clays are exported being respectively Poole, Teignmouth and Bideford, though much of the clay is now sent away by railway transport. These clays are all of Tertiary age, those in Dorset being Eocene, while those in South Devon, and very probably, also, North Devon, are Miocene (Aquitanian) in age. They are associated generally with beds of lignite.

Owing to the non-plastic nature of residual kaolin or China Clay, these ball clays are a necessary ingredient of many white ware bodies, their function being to impart sufficient plasticity and bonding power for the manufacture of the ware. They must, therefore, be very plastic, have a high tensile strength, and be sufficiently low in colouring oxides to fire to a white colour. The high refractoriness of the English ball clays is no defect, while the fact that most of them tend to vitrify at temperatures in the neighbourhood of those attained in pottery biscuit ovens is an advantage.

Irish Deposits

The only other locality in the British Islands where any large deposits of clays of this type are found is in the neighbourhood of Lough Neagh in Ireland, where a series of clays of Older Tertiary age has been exploited from time to time for the manufacture of pottery. These deposits have recently been examined by W. B. Wright, who comes to the conclusion that these clays "have been derived from the destruction of a zone of lithomargic weathering," the zone being of post-Basaltic age and formed in part by the destruction of the Upper Basaltic Lavas. The Lough Neagh Series, which is covered by approximately fifty feet of overburden, is about 1,150 feet in thickness, and is subdivided into three parts. The upper consists of 833 feet of alternate sands and clays, the middle of 127 feet of shales, and the lower of 187 feet of sands and clays, while at the junction of the middle and lower there are 26 feet of lignite alternating with lignitic clay.

The upper clays all contain considerable amounts of iron compounds which become apparent when the clay is exposed to weathering; the colour of the fired product varies from a pale brown to a red. The lower clays, which are often extremely plastic, do not rust on exposure, but the content of iron oxide and their colour on firing are such as to render them of little value in the manufacture of white ware. Many of the beds contain appreciable amounts of quartz.

According to Furnival, plastic white-burning clays were proved in a boring near Clonmel in 1862 and also at Cashel, but the amount of material was small.

Imperial and Foreign Deposits

Many of the sedimentary kaolin deposits of the mainland of Europe are fairly white-burning and plastic. Moderately plastic, transported, clays of Eocene and Miocene age occur in various parts of Germany. Many of these, though highly refractory, vitrify at a fairly low temperature, but in most cases the colour of the fired clay is yellowish. This is particularly the case with the clays of Saarau and Rauske, in Silesia, Lausitz, in Saxony, Grossalmerode, in Hesse, Westerwald, and Bavaria, where the clays are used chiefly for the manufacture of refractory goods, terra cotta and stoneware.

In Czechoslovakia, at Chodau, Putschirn and in the neighbourhood of Pilsen, bedded deposits of "kaolin-clay" are found associated with sandstone and brown coal, but the clays generally require considerable purification by washing before they can be used for the manufacture of white ware.

A black clay of Mesozoic age on the Mattagami River, Ontario, and some Eocene clays at Willows, Saskatchewan, are said to have properties similar to those of ball clays.

In the United States of America, deposits which may be classed as ball clays are known in Florida, Tennessee, Kentucky, Alabama and New Jersey. With the exception of the clays in the last named state, which are Cretaceous in age, these deposits are all Tertiary. Of these, only certain of the clays in Tennessee, Kentucky and New Jersey are characterised by Ries as ball clays. A detailed account of the ball clays of Tennessee has recently been given by Schroeder. A plastic, white-burning clay, associated with quartz pebbles, occurs at several localities in Florida and is now generally known as "Florida Clay." This clay, which is Tertiary in age, resembles the English ball clays in chemical composition

except that, in the former, the alkalies are low. The so-called "Tennessee ball-clays" are associated with lignite and sands. The Kentucky Tertiary clays are likewise intercalated with sandy and lignitic material and are generally somewhat siliceous. The New Jersey clays, of Lower Cretaceous age, in the neighbourhood of Woodbridge and Amboy, include several white-burning varieties. The plastic clays of a similar age in Alabama are often low in iron oxide, but the silica content is usually high.

R. C. Callister has recently described certain ball clays found in Australia. These are plastic sedimentary clays associated with lignite deposits and are more siliceous than the English ball clays. After weathering, they become plastic and have a high tensile stength, but the colour on firing is generally cream to yellowish.

Methods of Working

In the early days of the ball clay industry the clay was obtained from open workings. After removal of the overburden, the clay bed to be worked was laid bare across the pit; it was then cut across (long-scoring) by a spade at regular intervals, and again at right angles (thirting or thwarting) to the long-scoring to give blocks which were approximately nine inches square. The blocks, about eight inches in depth, were dug by a tool known as a tubill. The blocks, which approximated to a cube, were lifted by a spiked instrument known as a poge and passed to the surface by men standing on a series of "eaves" or ledges on the side of the pit, situated at vertical intervals of five feet.

At the present time, the method of cutting the "balls" in the open pits is as described above, but the clay is now taken to the surface in tubs along inclined tramways. The sides of the pit are sometimes stepped to prevent slipping, the steps having a width of eighteen inches and a depth of twelve inches. Sometimes the "balls" are made to glide along the surface of the underlying bed to the tubs. In some cases, the clay is obtained from a type of open working known as a "four-sides," which is a rectangular open pit 20 to 24 feet square, the sides being heavily timbered to prevent them falling in. In this type of pit, the clay is brought to the surface in buckets hauled up by a crane. Much of the stoneware clay is obtained from these types of open workings.

Mining

The clays intended for the manufacture of white ware are usually, but not always, obtained by mining. A rectangular shaft, four feet by six feet, is sunk to the required depth, the sides being heavily timbered. Apart from water, the only trouble liable to be encountered is running sand, the movement of which has, on occasion, twisted and even destroyed the timbering. Such shafts rarely exceed one hundred feet in depth, the deepest in South Devon in 1925 being about one hundred and thirty feet. The shaft is divided by timbers into two sections, one four feet square, for the haulage of the clay and the other four feet by two feet, down which a series of ladders are placed for the passage of the miners.

When the clay bed is reached levels are driven into it in all directions to the dip or rise, as the case may be. These levels, which are about six feet in height and seven feet wide, are also timbered, the amount of timbering required varying with the nature of the clay. If the clay is short, it may have to be timbered at intervals of one foot, if plastic, two feet or more. The levels are rarely driven more than ninety feet from the shaft. The clay is first removed from the levels and then the sides are allowed to fall in and that clay removed. If the particular bed is ten or twelve feet in thickness, the timbers may be removed and the roof allowed to fall in, this roof being then got. The clay is transported to the bottom of the shaft in hand barrows, and removed to the surface in buckets. At one time the buckets were brought to the surface by means of a hand windlass, then by one operated by a horse, but now by a rope operated by mechanical or electrical means. There are usually no rails underground, but the roads are bottomed at intervals with dry clay from the surface.

Where necessary the water is pumped from the workings by Cornish pumps, but many shafts are sufficiently dry for this to be unnecessary. There are no return airways, the ventilation usually being controlled by a fan which works intermittently. Occasionally, in shallow shafts, the only means of ventilation is the periodic return down the shaft of part of the water pumped up. In most shafts the illumination is obtained from candles, but in a few cases electric hand lamps are used. Inflammable gas is unknown in the mines. When all the clay within a radius of sixty to ninety feet of the shaft has been obtained the shaft is abandoned.

Sorting and Preparation

When the clay reaches the surface it is hand-sorted into various grades, which are put in separate trucks running by rope haulage on tram lines to central depots. Such a shaft is normally operated by five men, four of whom are engaged in "getting" below ground while the fifth, on the surface, controls the haulage and hand-sorts the clay. The output varies up to eighteen tons per shaft per day.

At the North Devon Clay Co. works a somewhat different method of working is in operation. The shaft commences practically at the outcrop and follows the dip of the clay bed, the inclination being about 75° at the surface, but getting less as the depth increases. The vertical depth of the deepest shaft is about 350 feet, while the actual distance to the bottom is approximately 600 feet. The working levels are driven horizontally into the clay bed. The tubs by means of which the clay is brought to the surface run on a tramway on the lower surface of the shaft.

The clay undergoes comparatively little preparation after reaching the surface. The various grades are sorted out and blocks which show appreciable amounts of mundic (marcasite) or its decomposition products are eliminated. In some instances, the clay is subjected to a weathering process. It is laid out on an open floor in long heaps which are regularly wetted with water over a period which may extend to several months, while at the same time the clay is exposed to the vagaries of the weather.

The Uses of Ball Clay

In the manufacture of certain types of pottery, ball clay is used in the body in order to impart additional plasticity to it. A body in which China Clay is the sole clay present is liable to be difficult to work, and hence the necessity for the addition of a more plastic clay. The proportion of ball clay which can be used depends on the colour required in the fired body; if the latter be a high grade white earthenware, the addition of too much ball clay will affect the colour and hence the value of the ware. The amount used in the series of English bodies which have as their ingredients ball clay, China Clay, flint and stone, ranges from fifty per cent. in the case of cheap ivory ware to twenty-five per cent. in white earthenware, between twenty and twenty-five per cent. in granite bodies and semiporcelain and as low as twenty per cent. in certain white tile bodies.

It is also used to the extent of twenty-five to thirty per cent. in some insulator, mortar and sanitary-earthenware bodies. Normally, a bone-china body does not contain any ball clay, but if highly calcined non-plastic bone ash is used, a small amount of ball clay may be added to increase the plasticity of the body. It is also a constituent of the white engobe used in sanitary fireclay manufacture.

The darker-burning varieties and some of the more siliceous clays are used, both in Devon and Dorset, for the manufacture of various types of coarse ware such as salt-glazed stoneware, drain-pipes, flooring and other tiles, ornamental blocks such as copings and so forth, and common bricks. The more refractory dark-burning clays are used for the manufacture of firebricks, both as straight clays and as bond clays employed in conjunction with non-plastic refractory clays, while they are similarly utilised in certain instances in making saggars and in bonding abrasives such as carborundum, corundum and so forth. The so-called pipe clays are used for the manufacture of tobacco pipes, which is one of the oldest uses of these clays, while "household" clay is made into blocks for "whitening" steps.

The subject is discussed by Dr. Scott under the following headings: The South Devon deposits; the South Devon clay works; the North Devon deposits and clay works; the Dorset deposits and clay works; mineralogy and chemistry of the ball clays—mineralogical composition, analyses of ball clays, effects of various constituents on the properties and changes during drying and firing; physical properties of ball clays and methods of testing—texture, determination of contraction on drying and firing and of porosity, determination of softening point, modulus of rupture, tensile strength, and plasticity. A glossary of terms used in the industry is given.

Overseas Chemical Trade in July

A Recovery from the June Setback

THE Board of Trade Returns for July indicate that the value of imports of chemicals, drugs, dyes and colours during the month was £1,360,611, an increase of £235,406 on July, 1928; exports were valued at £2,260,041, an increase of £185,666, and exports of imported merchandise at £87,972, an increase of £447. For the seven months ended July 31, imports were valued at £9,272,322, an increase of £284,420 on the corresponding period of 1928; exports were valued at £15,003,343, an increase of £103,174; and exports of imported merchandise of £579,316, an increase of £6,445. Detailed figures are as follows:—

Imports

	Quantities Month ended July 31,		Value Month ended July 31,	
CHEMICAL MANUFACTURES AND PRODUCTS—	1928.	1929.	1928. £	1929. £
Acid Acetic.....tons	1,509	2,102	67,020	75,178
Acid Tartaric, including tartrates, not elsewhere specified..cwt.	6,532	5,331	23,983	32,624
Bleaching Materials ,,	9,503	14,408	8,583	10,885
Borax..... ,,	9,871	17,133	8,150	12,603
Calcium Carbide... ,,	54,840	60,071	33,219	36,540
Coal Tar Products value	—	—	52,458	62,632
Glycerine, Crude ..cwt.	49	365	150	706
Glycerine, Distilled ,,	459	986	1,324	2,126
Red Lead and Orange Lead .....cwt.	3,135	5,355	4,300	7,799
Nickel Oxide..... ,,	111	219	480	1,226
Potassium Nitrate ,,	11,321	9,535	13,212	9,514
Other Potassium Compounds .....cwt.	54,524	150,517	36,920	73,027
Sodium Nitrate.... ,,	79,522	22,626	44,796	11,622
Other Sodium Compounds.....cwt.	39,525	44,757	26,363	30,743
Tartar, Cream of .. ,,	2,784	4,260	12,331	19,118
Zinc Oxide .....tons	961	1,054	30,577	31,251
All other Sorts....value	—	—	207,332	338,518
DRUGS, MEDICINES, ETC.—				
Quinine and Quinine Salts .....oz.	177,266	79,280	11,335	5,843
Bark, Cinchona, etc.cwt.	1,418	1,607	5,929	6,337
Other Sorts .....value	—	—	166,084	234,803
DYES AND DYESTUFFS—				
INTERMEDIATE COAL TAR PRODUCTS.....cwt.	—	306	—	3,199
Alizarine ..... ,,	117	136	3,923	4,575
Indigo, Synthetic . ,,	—	—	—	—
Other Sorts ..... ,,	3,325	4,155	78,357	87,663
Cutch ..... ,,	6,009	2,383	8,609	4,119
Other Dyeing Extracts cwt.	2,733	4,292	8,726	15,677
Indigo, Natural ... ,,	—	—	—	—
Extracts for Tanning ,,	96,412	52,087	105,975	55,236
PAINTERS' COLOURS AND MATERIALS—				
Barytes, ground, and Blanc Fixe ..... cwt.	61,163	64,056	13,073	13,565
White Lead (dry) . ,,	10,577	9,996	16,410	17,461
All other Sorts .... ,,	98,761	102,585	135,586	156,021
Total of Chemicals, Drugs, Dyes and Colours ..... value	—	—	1,125,205	1,360,611

Exports

CHEMICAL MANUFACTURES AND PRODUCTS—				
Acid Sulphuric ....cwt.	8,222	20,080	4,555	6,501
Acid Tartaric ..... ,,	1,613	2,067	10,327	14,935
Ammonium Chloride tons	377	255	7,102	4,812
Ammonium Sulphate—				
To Spain and Canaries tons	10,729	7,643	97,576	68,156
,, Italy ..... ,,	471	389	4,263	3,666
,, Dutch East Indies tons	88	579	853	5,576
,, Japan ..... ,,	10,890	11,013	101,556	101,484
,, British West India Islands and British Guiana tons	1,045	1,973	9,925	18,727
,, Other Countries ,,	14,588	19,041	139,795	178,908
Total .... ,,	37,811	40,638	353,968	376,517

	Quantities Month ended July 31,		Value Month ended July 31,	
	1928.	1929.	1928. £	1929. £
Bleaching Powder cwt.	64,438	45,192	23,766	11,824
COAL TAR PRODUCTS—				
Anthracene .....cwt.	—	18	—	10
Benzol and Toluol galls.	874,123	229,036	46,436	17,241
Carbolic Acid.....cwt.	19,699	14,531	32,790	22,514
Naphtha ..... galls.	5,321	4,565	434	515
Naphthalene (excluding Naphthalene Oil) cwt.	2,969	6,511	1,798	2,728
Tar Oil, Creosote Oil, etc. .....galls.	3,742,917	3,632,304	133,249	98,213
Other Sorts .....cwt.	62,739	20,473	33,670	13,542
Total....value	—	—	248,377	154,763
Copper, Sulphate of ..tons	2,460	1,922	57,039	48,249
Disinfectants, etc.....cwt.	29,708	33,114	72,890	82,518
Glycerine, Crude..... ,,	22	1,046	57	1,449
Glycerine, Distilled .. ,,	10,113	8,732	38,715	22,199
Total .... ,,	10,135	9,778	38,772	23,648
POTASSIUM COMPOUNDS—				
Chromate and Bi-chromate ..... cwt.	2,758	1,602	5,165	3,151
Nitrate (Saltpetre) ,,	1,304	1,562	2,458	2,873
All other Sorts .... ,,	4,257	1,154	12,771	13,420
Total ..... ,,	8,319	4,318	20,394	19,444
SODIUM COMPOUNDS—				
Carbonate, including Soda Crystals, Soda Ash and Bicarbonate cwt.	323,541	506,170	96,219	139,800
Caustic..... ,,	224,434	161,679	145,167	102,045
Chromate and Bichromate..... cwt.	2,682	2,941	3,818	4,784
Sulphate, including Salt Cake..... cwt.	121,460	279,368	14,141	34,299
All other Sorts .... ,,	46,569	80,121	47,528	88,711
Total .... ,,	718,686	1,030,279	306,873	369,639
Zinc Oxide ..... tons	92	101	3,271	3,646
Chemical Manufactures, etc. all other Sorts ....value	—	—	274,516	382,119
Total of Chemical Manufactures and Products ..value	—	—	1,421,850	1,498,615
DRUGS, MEDICINES, ETC.—				
Quinine and Quinine Salts .....oz.	233,551	218,713	23,065	21,356
All other Sorts ... value	—	—	221,069	279,625
Total .... ,,	—	—	244,134	300,981
DYES AND DYESTUFFS—				
Products of Coal Tar cwt.	7,385	13,457	64,978	88,152
Other Sorts ..... ,,	8,272	7,358	7,203	7,193
Total .... ,,	15,657	20,815	72,181	95,345
PAINTERS' COLOURS AND MATERIALS—				
Barytes, ground, and Blanc Fixe ..... cwt.	5,240	4,530	2,821	2,427
White Lead (dry) . ,,	6,400	4,129	11,356	8,841
Paints and Colours, in paste form ..... cwt.	38,140	39,751	78,203	80,846
Paints and Enamels Prepared (including Ready Mixed) .....cwt.	43,358	50,899	141,808	157,875
All other Sorts .... ,,	55,975	62,101	102,022	115,111
Total .... ,,	149,113	161,410	336,210	365,100
Total of Chemicals, Drugs, Dyes and Colours ... value	—	—	2,074,375	2,260,041

Re-Exports

	Quantities Month ended July 31, 1928.	Quantities Month ended July 31, 1929.	Value Month ended July 31, 1928. £	Value Month ended July 31, 1929. £
CHEMICAL MANUFACTURES AND PRODUCTS—				
Acid Tartaric.....cwt.	111	157	843	1,208
Borax..... ,,	80	400	68	400
Coal Tar Products. value	—	—	52	1,945
Potassium Nitrate..cwt.	149	42	250	69
Sodium Nitrate.... ,,	1,364	596	714	301
Tartar, Cream of .. ,,	230	306	1,178	1,468
All other Sorts....value	—	—	35,161	30,644
DRUGS, MEDICINES, ETC.—				
Quinine and Quinine Salts .....oz.	18,097	31,759	1,038	3,276
Bark, Cinchona, etc.cwt.	538	597	4,337	2,530
All other Sorts....value	—	—	31,347	30,231
DYES AND DYESTUFFS—				
Cutch .....cwt.	1,048	1,137	1,660	2,076
Other Dyeing Extracts cwt.	129	166	1,684	1,915
Indigo, Natural ... ,,	2	34	70	1,137
Extracts for Tanning ,,	515	2,397	667	3,001
PAINTERS' COLOURS AND MATERIALS.....cwt.	2,450	16,994	7,768	7,712
Total of Chemicals, Drugs, Dyes and Colours ... value	—	—	87,525	87,972

Deaths from Refrigerant Fumes

TO THE EDITOR OF *The Chemical Age*.

SIR,—About a fortnight ago I saw a report in the *Evening News* with regard to deaths in Chicago due to the inhaling of refrigerant fumes. I at once obtained some editions of the *Chicago Tribune*, and the following observations are a result of my perusal of the various publications.

Any gas inhaled is fatal, even oxygen. Poisons depend upon the quantity taken, that is, they are a matter of dosage. Refrigerant fumes, being heavier than air, would lie near the floor. Draught from open windows, etc., would blow them in one direction.

The American paper states that a sizzling noise was heard by a person entering the apartment in which the leakage occurred. For escaping fumes to cause a sizzling noise, there must have been a very large leakage. The building was of five stories containing seventy apartments, all supplied with cold from a multiple system in the basement. It is stated that a large amount of gas in the multiple system leaked into the small apartment. It is therefore likely that this one apartment had its own quantity of gas and some of that belonging to the sixty-nine other apartments. During the evening the family felt ill and retired to bed, and were found late the following day dead. This shows a constant increase in the volume of gas. Had the refrigerating plant been of small size, sufficient to supply the apartment alone with cold, death could not have occurred.

It has been suggested that a distinctive odour or irritant should be imparted to the refrigerant. The mixture of a refrigerant with other products would not render it innocuous. To a person awake it might give warning, but to anyone asleep or without a sense of smell it would be useless. The refrigerant and its fumes should be secured in a strongly constituted machine without movable joints. It should be remembered that all refrigerants are poisonous, as is everything except the air we breathe.

Leakage from a refrigerating machine is akin to leakage of coal gas supplied in geysers and cooking stoves. Either the installations are faulty or perhaps of such a flimsy nature that an actual breakage of a small part, or the puncturing of a pipe with a sharp instrument in order to obtain ice which collects, may have been the cause.

It is risking too much to instal seventy or more branches of refrigerating cabinets from one main large source when one small plant, if faulty, could receive the whole contents of the large installation. Separate installations are easily worked with between two and five lb. of gas, the escaping vapour from which would not be sufficient to cause death, and which owing to its heavy nature would remain close to the floor. Chicago is lucky that its 150,000 installations mentioned are not all supplied from one source.

All devices have a beginning, and as it is stated that over two million refrigerators have been installed in the country, the Chicago total of seven deaths attributed to refrigerating gases cannot be considered a high one. The deaths from geysers and cooking stove fumes, not to mention petrol fumes, show a much higher percentage than the foregoing. In this country, the use of motor vehicles causes as many deaths and non-fatal accidents as would occur in a small war, but no one would compel the withdrawal of coal gas or petrol because of the blunders of individuals and faulty installations of flimsy or defective construction. I see it is related that a negro living in the building had pulled his ice-box away from the wall and that the flimsy connection had broken, immediately causing a flood of the gas to be released; but, taken all round, I consider that the installations have been of good quality and serviceable.

There is one factor, however, which should not be overlooked, and that is that methyl chloride and other similar hydrocarbons are highly inflammable, so that any escaping gas, if in sufficient quantity, would not alone cause unconsciousness and (if prolonged) death, but could, if brought in contact with a light, be the cause of fire, which from large installations as mentioned, would be most serious and might produce a veritable holocaust.

I, the writer of this, have had for twenty-five years the sole experience in this country of the manufacture of hundreds of tons of these refrigerant hydrocarbons. Not a single accident has occurred in my works, the personnel is exceptionally healthy, and any worker feeling a cold coming seeks the manufacturing room for a cure. In this room are many hundredweights of these products exposed to the air, yet there is no smell and no one has ever been troubled with drowsiness or malaise of any kind. The same applies to the filling of thousands of smaller vessels from the big ones, which operation is carried on in a similar innocuous manner.

The whole of the Chicago happening comes down to this: Modern inventions and the products arising from them are excellent servants but bad masters.—Yours, etc.,

ALBERT HENNING
(Chairman and Managing Director
August 12. Hedley and Co. (Leytonstone), Ltd.)

A New British Chemical Standard Bronze "A"

RIDSDALE AND CO., Middlesbrough, announce that the third of a series of non-ferrous standard analysed samples is now ready for issue. The analysis is as follows:—

	Per cent.
Copper	85·50
Tin	9·96
Zinc	1·86
Lead	1·83
Phosphorus	0·25
Antimony	0·24
Iron	0·07
Nickel	0·04
Arsenic	0·06

This standard has been prepared in order to meet the need of a gunmetal and a phosphor bronze, the two being combined in one standard. It is intended to enable chemists to check their methods of analysis and to settle disputes between buyers and sellers. The composition does not correspond to any particular specification, but the sample contains all the elements usually met with in the ordinary gunmetals and bronzes.

The analyses have been made by ten chemists experienced in testing this class of alloy; reference chemists, Government departments, manufacturers, and users are all represented.

The standard is available to anyone at a price based on ultimately covering the cost of preparing and issuing it. The three usual sizes, 50 grm., 100 grm., and 500 grm. bottles are provided, and a certificate giving the names of analysts collaborating, together with their analysis and notes on the methods used, is furnished with each sample. Further particulars may be obtained from British Chemical Standard Headquarters, 3, Wilson Street, Middlesbrough.

Advertising and the Standard of Living

Sir Ernest Benn's Address to the Berlin Conference

At the International Advertising Congress at Berlin, on Wednesday, August 14, Sir Ernest Benn (chairman of Benn Brothers, Ltd.) delivered an important address on "Advertising and the Standard of Living," the text of which is published below. It will be seen that, instead of presenting an apologetic case for advertising, Sir Ernest convincingly showed advertising to be a first necessity of industry, and to be one of the most potent and beneficent factors in expanding trade and raising the standard of living.

THIS is a business convention and it would, therefore, be out of place to make any reference to political matters. In England, and I believe to some extent in other countries, politicians are very prone to talk nonsense about business, but business men with a Christian humility which, if not completely wise, is at least thoroughly characteristic, impose upon themselves a self-denying ordinance and refrain from talking politics.

There are, however, two observations of a semi-political nature which an Englishman, having the honour to address a Berlin audience, is in duty bound to make. The first is with regard to political arrangements, peace treaties and such like things, existing between these two great nations. It should be recognised that in England as in Germany we are by no means unanimous in thinking that all that has been done since 1918 is the embodiment of perfect wisdom. There is, I believe, a growing consciousness of failure to serve to the full either the ends of justice or the sacred cause of international peace.

It would be improper to go beyond vague generalities such as these at an advertising convention, but in my second observation I am on safer and less controversial ground. The cause of peace and international goodwill can be furthered in no surer or better way than by business meetings such as the one in which we are all taking part this week. Business men or advertising men of different nations can meet on common ground, find common interests, develop understandings and render mutual aid far more readily than is possible in the meetings of statesmen and politicians. This is not because business men are necessarily better than statesmen or politicians (although I have my own views upon that) but because of the very nature of the matters upon which they are severally engaged. Trouble is the life-blood of politics, while the absence of it is the very breath of business.

Look to the Business Man

The healthy fashion of the age is to discuss the social well-being of the people. If only words were deeds the world is full of the possibilities of a better, happier, more plentiful life for the masses of the people who inhabit it. From China to Peru and from Iceland to the Southern Seas people everywhere are clamouring for the fruits of the earth and the products of the work of man, and there is no good reason why a large part, if not most, of these desires should not be realised.

But the business man, with the possible exception of the American business man, has failed to make it clear to the common people that he and he alone is capable of satisfying these very proper desires. The people are making the mistake of looking to the politician instead of to the business man, and it is unnecessary for me to tell you that they are looking in vain.

I am anxious that this great International Convention should make it clear to the world that advertising has a definite place in any sane scheme for raising the standard of life of the people. Advertising is not, as some people still seem to think, a luxurious superfluity which can be added to a business that is rich enough to carry it. Advertising must be recognised and classified as one of the most important of the raw materials of industry. Our political economy needs to be brought up to date, and this Convention can do something to help along that process. The standard of life of the people depends upon two things, first the production and secondly the distribution of wealth, things, goods and commodities.

The economic situation of the world as a whole can be stated in the very simplest terms. Great problems are always simple when considered in a large way; it is chiefly in the details that the difficulties are to be found. If therefore you look at the world as a whole you will notice that we succeed fairly well in the making of things, but have yet a lot to learn about the distribution of them.

I want this great conference to rank above all the political conferences with which Europe is littered, and to impress upon the minds of the people of the world that the raising of the standard of life of the whole people is a matter of selling and distribution. In other words, a matter of advertising. The political economy of the immediate past has devoted far too much attention to production and far too little thought to consumption. The politicians of the world have done far too much pampering and spoiling and ruining the so-called workers and have forgotten that the buyer, the customer, the consumer, is, of necessity, the predominant partner in industry and commerce. You can get machines to take the place of labour, you can get substitutes for almost every raw material, but the one and only thing that you cannot do without, that is absolutely indispensable to any industrial system, is your consumer. The sales managers and the advertising men of the world are the only people who appear to appreciate that basic truth. In my opinion, if it were possible, for say a decade, to forget altogether the worker, to wipe him out of our minds, and to give all our thoughts to distribution and consumption, we could fill the world with wealth.

The Importance of the Buyer

I do not remember in England the case of a single advertising man who has made much mark in politics, and this is natural when one remembers that advertising is based on sound practical economics. Modern politics makes the mistake of filling the whole picture with the worker. Advertising is wiser and recognises that the buyer is the all-important factor in the economic problem.

The same sort of criticism may be made in a more moderate way of the world of finance. The development of banking and credit machinery in the last 100 years is one of the miracles in human history, but that machinery is not yet complete. Our bankers and financiers have provided all the facilities that the world can want for the purpose of production. They have yet to recognise the enormous possibilities of the finance of consumption and consumer credit.

We must create a world in which it is as easy to buy as it is to make, and advertising in all its forms is the basis on which this great object will be accomplished.

Modern Nonsense

When the economic conversation of the common man is not nonsense, it concerns itself too much with questions of minor importance. Think of all the breath that is wasted in discussing what are called basic industries and of all the money and political effort that is expended in the endeavour to bolster up these basic industries with artificial aids.

Iron and steel are of no interest to the ordinary man and woman until long after they have left the furnaces, of which we hear so much, and have been sold, by advertising, as kettles or motor bicycles. I have never seen, and have no desire to see, an ingot of steel or a mass of pig iron, but I am deeply interested in the nib of my pen or the pattern of my garden gate.

Coal, so far as I am concerned, need not exist but for my need of the products of the furnace that it feeds.

Shipping, on which we set such store, is an empty, seasick affair but for the advertising which teaches each country of the products of the others.

Take again the nonsense that is talked about the simple life; the absurd people who work themselves into a semi-sane condition and distort all their artistic and poetic values. People who, while pretending to see evil in the desire of a youth for a wrist watch, or a maiden for a new pochette, will find an exaggerated beauty in the gluttonous, vomiting, bestial life of the bumble bee.

It is argued that advertising creates desires for unnecessary and useless things, that it promotes unproductive expenditure,

that it fosters a taste for luxury, and that it leads to extravagance.

People who talk this way have never bothered to think, they simply do not know the meaning of the words they use. They have never troubled to define economy or extravagance. They don't understand civilisation and have no real conception of progress. Civilisation is a process of evolution, in which man's desires, and his ability to satisfy them, march forward together. When we cease to create new desires we stop the process of civilising. Every new desire will be thought at first to be unnecessary, extravagant, ostentatious or anti-social. It has always been so. The first man who wore a shirt faced the envy and criticism of all his fellows, and I do not doubt that the Chancellor of the Exchequer of the day picked him out for special punitive taxation.

The fact is, of course, that the luxury of yesterday is the comfort of to-day and the necessity of to-morrow, and behind that natural and wonderful process, the process of steadily raising the standard of human life, the main driving force is advertising.

If you lessen the desire of people for things, trade and industry and civilisation go down. If, on the other hand, you cultivate and strengthen the desire for a greater variety of material amenities, then civilisation goes forward.

The universal social problem is the standard of living of the people. The standard of living is governed by the amount of real wealth in the world, and I submit to you that our troubles arise because of the failure of people generally to realise the true nature of wealth. This conference can do something to rectify that error. All over the world you find the puzzling, paradoxical position of poverty caused by over-production; miners in trouble because there is too much coal; shipbuilders in difficulty because there appear to be too many ships, and so on.

Wealth in Exchange Value

John Stuart Mill, still the greatest of all economists, gave us the most perfectly scientific definition and laid it down that, "Wealth is all things useful and agreeable having exchange value." Every boy and girl who hopes to be considered as civilised ought to be made to learn that definition by heart. "Wealth is all things useful and agreeable having exchange value." You will notice that Mill ignores all questions of manufacture and making, says nothing about production or labour or employment, leaves aside even such important matters as science and design. The only factor in the composition of wealth that he deems it worth while to mention is exchange. Wherever a thing comes from; whatever it is made of; whether it merely grows or is the outcome of infinite labour; however much legislation or tariff or trade union power may be mixed up with it, it is not wealth until exchange value has been given to it. And what is the purpose of advertising except to give exchange value. If people would give one-tenth of the thought which is now given to false issues about labour and production to the consideration of exchange, salesmanship and advertising, the standard of living of the people would go and keep on going from better to better and better still.

I do not fear that anybody here will misunderstand me when I venture to claim that it is appropriate for this sort of thought to be spoken at an international convention by a delegate speaking the English language. Few will be found to deny that it was England who taught the world how to manufacture the things that go to make modern civilisation. And now, quite appropriately and quite properly, it is another branch of the English-speaking people that is going to show the world how to complete the good work. If England taught us how to make, America is teaching us how to sell—how to advertise. We Englishmen are very glad and proud to be here in company with such a large and talented representation of American advertising genius.

In conclusion, my hope is that this great convention may be able to do something, first, to give to advertising men generally a still higher conception of the importance of their great calling, and, secondly, to give to the world at large a truer conception of the part which advertising plays in the provision of a better standard of life for the struggling masses of mankind. We must strive, as Wordsworth puts it:

> "To elevate
> The grovelling mind, the erring to recall,
> And fortify the moral sense of all."

Death of Dr. Twitchell

Dr. Ernest Twitchell, whose death has recently been announced, was born in Cincinnati on February 26, 1863. In 1886 he graduated with the degree of B.Sc., at the University of Cincinnati, where, under F. W. Clark and T. H. Norton, he laid the foundation of his future work in the field of chemistry. In the same year he accepted a position with the Emery Candle Co. as chemist and later as general manager, a position he filled for more than forty years. It was there, while

The Late Dr. E. Twitchell.

pursuing his research work, that he discovered and perfected the process with which his name is identified.

A company was formed, called the Twitchell Process Co., to exploit the new method of fat splitting by means of naphthalene stearo-sulphonic acid. It is doubtful if this company would ever have been promoted by Dr. Twitchell had not his friends and associates foreseen the financial possibilities of his process. Dr. Twitchell was always more interested in research and in experimental chemical work than in financial exploitation.

In 1915, his University conferred upon him the honorary degree of Doctor of Science, and in 1917 he was presented with the Perkin medal "for original and valuable work in applied chemistry." Although best known internationally for his Twitchell process, Dr. Twitchell made many other contributions to the knowledge of the chemistry of fats. In 1891 he worked out his method for the determination of rosin in fatty acid mixtures from soaps. He developed a method of determining the composition of mixtures of fatty acids, and his studies of the eutectics of mixtures of fatty acids to obtain proper crystallisation and separation are all of lasting value. Dr. Twitchell served as president of the Cincinnati section of the American Chemical Society in 1896.

Of a quiet and retiring disposition, Dr. Twitchell yet made many friends. His life was entirely devoted to chemistry, and his only relaxations were fishing and shooting.

Metallised Paper

The claim is made by M. U. Schoop, of Zurich, that he has produced metallised paper, which can be neither torn nor ignited. Paper coated with tin, copper and aluminium is produced by a new process: the metal is melted, and the paper pulp coated with it by means of a suitable atomiser. In earlier attempts to achieve the same end, the structure of the paper fibres is said to have suffered, but this is now avoided. The paper sheets, which, in spite of their strength are unusually elastic, will find application in telephony and radiotechnics. In addition, there is an obvious field for the production from metallised paper of banknotes, which would be almost indestructible and not readily damaged. By the use of special alloys for the production of such notes, forging could be rendered impossible.

Prosecution under Artificial Cream Act

The First Case

In a case, stated to be the first of its kind, under the Artificial Cream Act, 1929, the Ferns Pure Milk and Cream Co., Ltd., of Howland Street, W.C., were at Marlborough Street Police Court, on Tuesday, fined £10 2s. and ordered to pay £7 costs. Notice of appeal was given, and Mr. Mead, the magistrate, agreed to state a case.

The company was summoned for selling or offering for sale a substance purporting to be cream or artificial cream without describing it as "artificial," and also for using a receptacle for the conveyance of artificial cream without having the words "artificial cream" on it. Mr. G. B. McClure, prosecuting for the National Farmers' Union, said that artificial cream could not be distinguished by analysis from ordinary cream, and the Act was passed at the instigation of the National Farmers' Union in order that the purchaser might know he was getting artificial cream.

Mr. B. M. Cloutman, who defended, said that the infringement of the Act was only technical. The prosecution was brought within six weeks of the passing of the Act when things were in a state of transition, and he contended that if the food and drug authority did not see fit to take action that was a complete answer to the summons.

Mr. Mead, who ruled against Mr. Cloutman's contention, said that the Act stated: "It shall be the duty of every food and drug authority to enforce the provisions of this Act," but that did not exclude other persons from taking action. If the food and drug authority was not sufficiently vigilant there was nothing to prevent other people prosecuting.

John Lamont, an employee of the National Farmers' Union, said that he purchased from the company a carton of artificial cream on which there was nothing to indicate that it was artificial cream.

Mr. R. J. Ellinghouse, the company's sales manager, said that they manufactured artificial cream and sold it to retailers. A supply of labels and cartons complying with the Act was ordered immediately after the Act was published, but for a few days it was necessary to use the old cartons.

The Magistrate's Views

Mr. Mead remarked that the name of the company seemed to him to be misleading, as the ordinary person would think that it referred to natural cream and milk. He supposed the Act was passed to protect the interests of farmers in this country. The struggle to make agriculture pay was a severe one. It might be that manufactured cream contained fewer malignant germs than natural cream, but whether that was so or not there was a prejudice in favour of natural cream. The price of ordinary cream was higher than that of the manufactured article, and therefore he thought that farmers had a perfect right to be protected, as they were protected, by the Act. The Act was no good unless it was enforced, and nobody could complain because, as soon as the Act was passed, the persons interested took care to see that it was not a dead letter. Mr. Mead added that he did not regard the offence as a technical one.

Sale of Foods and Drugs in South Africa

The Federation of British Industries has secured copies from its representative in South Africa of an Act recently passed by the South African Government consolidating and amending the laws regarding the marking and sale of foodstuffs and drugs throughout the Union. Copies of the Draft Regulations issued by the South African Minister of Health who is responsible for the administration of the new Act have also been obtained by the F.B.I., and these are due to come into force simultaneously with the Act on January 1, 1930. Consequently the time allowed for British manufacturers of articles affected to make representations is somewhat limited. The Federation has immediately taken steps to ascertain the view of the trades affected, and copies of the Regulations have been sent to the Trade Associations concerned. Should it prove to be necessary, it is proposed to make representations in order to secure the amendment of such regulations as may be considered seriously detrimental to manufacturing interests or unworkable in practice. It is understood that copies of the regulations in question and of the Act itself may be inspected at the Office of the High Commissioner for the Union of South Africa, South Africa House, Trafalgar Square, London, W.C.2.

China Clay Imports—July, 1929

A return showing the quantities and value of China Clay imported into Great Britain and Northern Ireland, as registered in the month of July, 1929, is as follows:—

Country Whence Consigned.	Quantities.	Value.
	Tons.	£
Germany	51	179
France	8	37
U.S. America	27	150
Total	86	366

China Clay Exports—July, 1929

A return showing the quantity and value of the exports of China Clay, the produce of Great Britain and Northern Ireland, from Great Britain and Northern Ireland as registered in the month of July, 1929, is as follows:—

Country of Destination.	Quantity.	Value.
	Tons.	£
Finland	504	1,285
Estonia	10	34
Sweden	1,178	1,732
Norway	1,081	1,602
Germany	2,419	4,739
Netherlands	1,893	4,824
Dutch Possessions in the Indian Seas	100	260
Belgium	3,869	8,355
France	3,130	6,882
Switzerland	85	259
Portugal	2	15
Spain	2,155	6,241
Italy	1,370	3,421
Austria	—	5
Greece	9	55
Egypt	10	37
Siam	10	55
China	10	47
United States of America	33,886	76,376
Mexico	20	100
Peru	5	24
Uruguay	1	3
Argentine Republic	17	108
Irish Free State	2	8
Union of South Africa (excluding S.W. African Territories)	4	56
British India, via Bombay	752	3,595
Via Madras	19	86
Via Bengal, Assam, Bihar and Orissa	245	1,036
Australia	12	121
New Zealand	2	11
Canada	136	935
Total	52,936	122,307

Voluntary Liquidation of Zinc Oxides, Ltd.

Pursuant to the provisions of the Companies (Consolidation) Act, a meeting of the creditors in the voluntary liquidation of Zinc Oxides, Ltd., of Cardiff, was held recently at the offices of R. J. Ward and Co., 10, Serjeant's Inn, Fleet Street, E.C. Mr. W. Boniface, the liquidator of the company, reported that the company went into liquidation following the appointment of a receiver for the debenture holders on July 10 last. The company was registered on February 21, 1925, with a nominal capital of £5,000, divided into ordinary shares of the face value of £1 each. The issued capital was £4,950, all of which was fully paid, and there were debentures for £4,000. The unsecured creditors' claims totalled £4,146, and according to the last balance sheet the assets amounted to £7,890. The voluntary liquidation of the company is being continued with Mr. Boniface as liquidator.

American Trade Commissioner in London

Mr. Homer S. Fox, American Trade Commissioner in London, whose surveys of British chemical industry have attracted considerable attention, is leaving for his vacation in the United States this month. During his absence Mr. Roger R. Townsend, who has recently joined the American Government staff at Bush House as Trade Commissioner, will take over Mr. Fox's duties in connection with chemical affairs. Mr. C. C. Concannon, chief of the Chemical Division of the Bureau of Foreign and Domestic Commerce in Washington, is now in Europe and hopes to visit London about the end of this month.

Benn Brothers' Annual Meeting

Sound and Progressive Expansion

THE 33rd annual general meeting of the shareholders of Benn Brothers, Ltd., was held on Friday, August 9, at Bouverie House, Sir Ernest Benn (chairman of the company) presiding.

Increased Dividend

In moving the adoption of the audited report and balance sheet for the year ended June 30, Sir Ernest stated that abont £4,000 more was being distributed to shareholders, as the dividend was up to 20 per cent. In that respect he would like to correct an impression which had been created on the part of the vulgar and misinformed public Press that a sudden accession of wealth had come to the company. If they had had some wonderful luck or unexpected bit of profit he would be the last man on earth to recommend it for dividend. The increase in the dividend on the ordinary shares was long overdue. For about nine years the shareholders had received 17½ per cent., during which period the management had acquired three or four important journals, set on their feet two associated companies, and had built Bouverie House, on which there was now only a bank loan of £20,000. To add 2½ per cent., therefore, to the dividend was felt to be a safe thing to do and was but a small step to, it was hoped, a still more adequate dividend in the future.

The British Business Man

The Chairman added that it had been the custom at similar meetings in the past to say something about the state of trade as a whole. The company claimed, as the largest trade and technical paper publishers outside America, to know something about the real state of trade in this country, and as a result of that very intimate touch which their trade papers had with literally hundreds of thousands of business men, the company knew more about the conditions of trade and industry than politicians. The present-day British business man was a very marvellous creature. He not only provided a thousand million a year in rates and taxes, but he accomplished this astounding feat in face of unprecedented difficulties. He had to work inside a ring fence of bureaucrats, trade union officials, and other officials of various kinds, whose aim and object it was to see that his standards, whether in buildings, or equipment or output or in any other way, were carefully kept down to the mediocre level of the mass.

The British business man had somehow to rise above the pessimistic atmosphere created by the politicians. When talking of trade, the politician, who lived on trouble, adopted the policy of stinking fish, and the crying of stinking fish had long been recognised as highly detrimental to business success. Notwithstanding all this, the British business man to-day not only delivered the goods but employed more people at better real wages than ever before in our history. He knew of no higher achievement in the story of human endeavour. The skill, wisdom, energy and enterprise of the modern business man had never been approached by any other class or any other nation, at any other time.

A Policy of Optimism

Returning to the more particular sphere of Bouverie House, the Chairman said the company's policy was one of optimism and cheerful encouragement, for it took pride in the fact that British trade was really doing better. If they could think of some way of ridding the country of the vague pessimisms about trade and industry and putting business men in their proper place in public opinion they would have done something worthy of the shareholders of Benn Brothers, Ltd.

The company, he remarked, had a greater aim than that of mere money-making. During the year he had been President of the National Advertising Benevolent Society; Mr. Gordon Robbins was chairman of the Council of the Newspaper Press Fund; Mr. E. E. Starke was the life and soul of the Royal Metal Trades' Pension and Benevolent Society, being on the Board of Management; while Mr. Crole-Rees was a member of the executive council of the Furnishing Trades Benevolent Association. Some of their 14 editors likewise played an important part in public affairs, as, for instance, Mr. H. H. Wardle and Mr. Vestey in connection with the Imperial Fruit Show.

In moving the adoption of the report and balance sheet, Sir Ernest, in conclusion, recommended, on behalf of the Board, the following dividends:—3 per cent. on the Preference Shares, which, with the interim dividend of 3 per cent. paid in February, makes 6 per cent. for the year; 13¾ per cent. on the Ordinary Shares, which, with the interim dividend of 6¼ per cent. paid in February, makes 20 per cent. for the year; 2s. 9d. per share on the Deferred Shares, which, with the interim dividend of 1s. 3d. per share paid in February, makes 4s. for the year.

Mr. Gordon Robbins, the deputy chairman, seconded the resolution.

An "Outside" Shareholder's Tribute

Mr. Catchpole, an "outside" shareholder, congratulated the directors on the excellent result shown, and the resolution was carried unanimously.

Mr. Crole-Rees proposed that Mr. C. E. Hughes and Mr. W. G. Rivington be re-elected directors of the company. Mr. Starke seconded the motion, which was carried without dissent.

The auditors were re-elected on the proposition of Mr. Gale, seconded by Mr. Savage.

A vote of thanks to the Chairman, whom he described amid applause as the mainspring of the business, was proposed by Sir Robert Welsford, President of the Law Society, who emphasised the continued growth of their wonderful business. Shareholders, he remarked, had no right to expect more than 20 per cent. dividend, which had been rendered possible by expansion here and expansion there, the benefit of which had been felt throughout the whole of the concern. The vote was carried unanimously.

Düsseldorf Meeting of Institute of Metals

THE arrangements for the Düsseldorf meeting of the Institute of Metals (September 9-12) are now complete, and the meeting promises to be a notable one in every way. Over 200 persons from ten different countries will take part in the gathering. The proceedings will open on September 9, with the Annual Autumn Lecture. This will be given by Dr. A. G. C. Gwyer, on "Aluminium and its Alloys." Visitors' tickets admitting to the Düsseldorf meeting may be obtained on application to the secretary of the Institute of Metals, 36, Victoria Street, London, S.W.1. Dr. A. G. C. Gwyer, of Warrington, England, who will deliver the Eighth Autumn Lecture, is a member of council of the Institute of Metals and an Original Member of the Institute. He was born in Bristol, and studied at University College (now the University of Bristol), taking the degree of B.Sc. as an external student of London University. He held the Capper Pass metallurgical scholarship for two years, and subsequently was awarded a research scholarship by the Royal Commissioners of the Exhibition of 1851. With the aid of this research scholarship he spent two years at the University of Göttingen, carrying out metallographical research under Professor Tammann. Dr. Gwyer took the degree of Ph.D. at Göttingen. The title of his Inaugural-Dissertation was "Uber Die Legierungen des Aluminiums mit Kupfer, Eisen, Nickel, Kobalt, Blei und Cadmium." Upon returning to England he spent one complete session carrying out scientific research in Sir William Ramsay's laboratory at the University of London, but subsequently decided to adopt a metallurgical career and took the metallurgical course at the University of Birmingham. In 1911 Dr. Gwyer was appointed Junior Assistant in the Department of Metallurgy at the National Physical Laboratory, Teddington, and in 1912 he became Research Metallurgist to the British Aluminium Co., Ltd., Milton, Staffordshire. He was transferred in 1915 to the Warrington works of the same company, and in 1920 was appointed chief metallurgist. Dr. Gwyer is part-author of several papers, dealing with the constitution of aluminium alloys, that have been published in the *Journal of the Institute of Metals*.

Appointments Vacant

ASSISTANT LECTURER IN METALLURGY AND ASSAYING in the Municipal College of Technology, Manchester. Details on p. xxi.

CHEMIST OR ENGINEER OR CHEMICAL ENGINEER with experience in the manufacture of silk by the dry (acetate) process. Details on p. xxii.

WORKS CHEMIST for the manufacture of red lead and litharge. Details on p. xxii.

PLANT CHEMIST for the manufacture of cellulose acetate. Details on p. xxii.

CHEMICAL WORKS FOREMAN, experienced in organic processes. Details on p. xxii.

From Week to Week

RECENT WILLS INCLUDE: Mr. Arthur Doyne Adams, manager of the Morgan Crucible Co., Ltd., £7,730.

THE PEILL GLASS WORKS, at Dueren, Germany, which at the beginning of the year employed 600 men, are to close down at the end of the month owing to lack of business.

"PHOSPHAMMO" AND "SUPERPHOSPHAMMO" are the names of fertilisers, registration of which as trade marks has been applied for by Synthetic Ammonia and Nitrates, Ltd.

LORD MELCHETT'S speech on "International Industry and the Young Plan," delivered at the International Chamber of Commerce Conference at Amsterdam, is now published as a booklet of 23 pages (2s.).

SMALL PRODUCERS OF ASBESTOS in South Africa are considering the establishment of an organisation to control the output and sale of the fibre. Ruthless competition has lately taken place among producers.

TWO HUNDRED AND THIRTY THOUSAND ACRES of sugar beet are being grown in England and Wales this year, a record in the history of the industry. The crop appears generally to have withstood the drought fairly well, but the recent rains have been timely.

MR. C. S. GARNETT has arrived in India, on his way to Assam, to investigate the recently discovered deposits of sillimanite. If the sillimanite is found in sufficient quantities, it will be a valuable source of wealth to Assam, and will lead to the establishment of a highly profitable new industry.

THE COMMITTEE ON NOMENCLATURE, Spelling and Pronunciation of the American Chemical Society is making an effort to determine the usage for some of the commoner chemical words, and to see if some standards of pronunciation can be established. The committee will be glad to hear from chemists interested. A list of chemical words with various pronunciations indicated is being prepared.

PROFESSOR BERGIUS has recently submitted to the Ministries for Economic Affairs for Agriculture and for Food Supply a project for the production of cattle fodder by the hydrolysis of wood. These Ministries manifest great interest in the matter, and are organising exhaustive tests in order to ascertain the efficacy of the new fodder. Meanwhile, Professor Bergius is arranging with the Berlin banks for the financing of a factory in Stettin.

LORD LEE OF FAREHAM has accepted the appointment of chairman of the Radium Commission, which will be responsible for the custody, distribution and use of the radium to be purchased by the National Radium Trust. Other members of the Commission include Dr. S. Russ, professor of physics at the Middlesex Hospital Medical School, and Dr. G. W. C. Kaye, superintendent of the physics department at the National Physical Laboratory. The Trust itself, which met on Tuesday and made preliminary arrangements in connection with the purchase of radium, is presided over by Lord Parmoor, and includes among its members Sir Ernest Rutherford, president of the Royal Society.

THE PRODUCTION OF METALLIC CADMIUM in the United States in 1928 amounted to 1,875,896 pounds, valued at $1,144,297. This is an increase of 75 per cent. in quantity over the production of 1,074,654 pounds in 1927. There were 233,101 pounds of cadmium, valued at $128,901, imported into the United States during 1928, compared with 22,400 pounds, valued at $13,172, in 1927. No imports of this metal were recorded for 1926. In addition to metallic cadmium, domestic manufacturers reported some production of the following cadmium compounds in 1928: Cadmium sulphide, cadmium sulphate, cadmium hydrate, cadmium oxide, and cadmium lithopone. The estimated cadmium content of cadmium compounds produced was 240,000 pounds, valued at $228,013, in 1928, compared with 229,000 pounds, valued at $191,051, in 1927.

MR. MEURIG LLOYD DAVIES, father of Mrs. Rudolph Muspratt, presided on Saturday at the National Eisteddfod at Sefton Park. Mr. Davies, who is a technical chemist by profession, was born in Liverpool in 1865, and is a member of a well-known Welsh family. He was educated at the Liverpool College, and has long been associated with the chemical industry. He was articled to James Muspratt and Sons, chemical manufacturers, of Liverpool, and became manager of their Liverpool works in 1890. This company was absorbed by the United Alkali Co. in the same year, and three years later Mr. Davies was made manager of the Hutchinson works of the company at Widnes. Mr. Davies went to America as managing director of the North America Chemical Co., Bay City, Michigan, in 1899, and then to Toronto as vice-president and general manager of the Standard Chemical Co. of Canada in 1913, becoming president in 1924. During the last five years of his residence in the States he was a director of the First National Bank, Bay City, Michigan, and also president of the Civic League of the same city. He is the chairman of the Canadian Chemical Association (Toronto branch), a Fellow of the Canadian Institute of Chemistry, and member of the Society of Chemical Industry.

THE NUMBER OF STUDENTS taking courses in Germany last (summer) term was 2,679 in the universities, and 2,497 (including students of metallurgy) in the technical schools.

THE NITRATE RESEARCH CORPORATION, Baltimore, Md., U.S.A., has been organised for research work in the nitrate industry. The incorporators are C. A. Wilson, Leo Gottlieb, and H. R. Moore.

"THE CHEMICAL AGE" and its associated journals were represented at the International Advertising Convention in Berlin by Sir Ernest Benn, Mr. Glanvill Benn, and Mr. H. B. Crole-Rees (all directors of Benn Brothers, Ltd.), and Mr. R. D. Savage.

BRITISH RAYON PRODUCTION in the second quarter of 1929 amounted to 13·2 million lb., of which 11·2 million lb. was sold at home. For the corresponding quarter of 1928 production totalled 13·8 million lb., home requirements reaching 10·7 million lb.

THE UNITED MOLASSES CO., LTD., states that in view of the extent and importance of the company's interests in the United States of America and Cuba, it has been found advisable, for the efficient management of the American part of the company's business, to appoint an American board of directors.

TWO OF THE LEADING Silesian cellulose and paper manufacturing groups, the Schlesische Zellulose und Papierfabriken and Ostdeutsche Papier und Zellstoffwerke, are raising capital by means of a transfer of shares to English concerns. It is possible that this may be a preliminary step towards the formation of an international cellulose cartel.

SIR ROY WILSON has retired on medical advice from the chairmanship of the committee appointed by the Board of Trade to inquire into the position as to the supply of scrap for steel making. In view of this and of the appointment by the Prime Minister of a sub-committee of the Committee of Civil Research to inquire into the iron and steel industries generally, it has been decided to merge the scrap inquiry in the larger investigation. The sub-committee will accordingly give special consideration to the question of the use and supply of scrap.

THE FOLLOWING PAPERS were published by members of the Wellcome Chemical Research Laboratories in 1928:—In the *Journal of the Chemical Society*: "Action of Beckmann's chromic acid mixture on some monocyclic terpenes," by T. A. Henry and H. Paget; "The Alkaloids of Some Indian Aconites," by T. A. Henry and T. M. Sharp; "The Action of Aniline on *d*-Glutamic Acid," by W. H. Gray; "By-Products of the Gattermann Aldehyde Reaction," by F. Bell and T. A. Henry; "Investigations in the Diphenyl Series, Part VIII—Derivatives of 2- and 4-aminodiphenyl," by F. Bell; "The Alkaloids of Some Indian Aconites, Part II—Pseudaconitine," by T. M. Sharp; "Preparation of Diethylaminoethanol Esters of Diphenyl-2-Carboxylic Acid and Derivatives," by F. Bell.

THE POTASH STORAGE and loading installation, still under construction at Hamburg, Germany's principal potash harbour, has cost in the neighbourhood of £1,600,000. Its principal warehouse possesses a capacity of 120,000 metric tons, and the quay is long enough (over 900 ft.) to permit two ocean-going vessels to load at the same time. In the warehouse an elaborate system of conveyors reduces human power to a minimum. Four hundred tons of loose or bagged potash may be discharged from warehouse into vessel within one hour. By means of various technical contrivances different grades of potash may be discharged into a vessel's hold at the same time. Automatic scales, bagging arrangements and bag-sewing machines are also included. An interesting innovation is the heating of all means of conveyance to prevent caking.

MR. A. G. CHURCH, M.P., and Professor J. J. R. Macleod have been appointed members of the Medical Research Council. Mr. A. G. Church is Labour M.P. for the Central Division of Wandsworth. He is particularly interested in scientific matters, and at the time of his election was general secretary of the Association of Scientific Workers. In 1924 he visited tropical Africa as a member of the East Africa Parliamentary Commission of Inquiry, and was part author of the report. Professor Macleod, Regius professor of physiology in the University of Aberdeen, shares with Dr. Bantling the honour of the discovery of insulin, for which they were awarded the Nobel Prize. He was formerly demonstrator in physiology and lecturer in biochemistry at the London Hospital, and for a time worked with Dr. Leonard Hill on the physiological effects produced on animals by compressed air. In 1903 he became professor of physiology in the Western Reserve University, Cleveland, Ohio, and in 1918 he was elected to a similar post in the University of Toronto.

Obituary

RAOUL PIERRE PICTET, in Paris, recently, aged 84. Born in Geneva, where he held the post of professor of industrial physics (1879–1886), he published in 1877–1878 his first papers on the liquefaction of oxygen, etc., and on refrigerating machines.

DR. ERNEST TWITCHELL, widely known as originator of the Twitchell reagent, in Cincinnati, on June 6, aged 66. An obituary notice appears on another page.

MAJOR ALBERT RYDER KENWORTHY, chief mechanical engineer to the Rio Tinto Co., Ltd., at Rio Tinto, Spain, following an operation, on August 11.

References to Current Literature

British

ANALYSIS.—The sampling of gas over mercury at constant rate. S. Pexton and W. K. Hutchison. *J.S.C.I.*, August 9, pp. 242–244T.

GENERAL.—The human factor in industry. T. H. Pear. *J.S.C.I.*, August 9, pp. 227–232T.

The composition of wool fat. J. C. Drummond and L. C. Baker. *J.S.C.I.*, August 9, pp. 232–238T.

The production of gaseous, liquid, and solid hydrocarbons from methane. II. The action of spark discharge on methane. H. M. Stanley and A. W. Nash. *J.S.C.I.*, August 9, pp. 237–242T.

Physical chemistry in the science of biology. F. G. Donnan. *J. Chem. Soc.*, July, pp. 1387–1398. The first Liversidge lecture delivered before the Chemical Society.

OILS.—The drying of oils. R. S. Morrell and S. Marks. *Journ. Oil and Colour Chem. Assoc.*, July, pp. 183–205.

ORGANIC.—The constitution of linolic acid. R. D. Haworth. *J. Chem. Soc.*, July, pp. 1456–1461.

2 : 4-Dinitrobenzaldehyde as a reagent. G. M. Bennett and W. L. C. Pratt. *J. Chem. Soc.*, July, pp. 1465–1468.

The formation of thionaphthindole. E. W. McLelland. *J. Chem. Soc.*, July, pp. 1588–1593.

United States

ANALYSIS.—Determination of nitrate nitrogen in tobacco. H. B. Vickery and G. W. Pucher. *Ind. Eng. Chem., Analytical Edition*, July 15, pp. 121–123.

Determination of total replaceable bases in soils. R. H. Bray and F. M. Willhite. *Ind. Eng. Chem., Analytical Edition*, July 15, p. 144.

Analysis of insecticides containing fluorine compounds. L. Hart, *Ind. Eng. Chem., Analytical Edition*, July 15, pp. 133–135.

Improvements in Denigès' colorimetric method for phosphorus and arsenic. E. Truog and A. H. Meyer. *Ind. Eng. Chem., Analytical Edition*, July 15, pp. 136–139.

ANALYSIS, ORGANIC.—Rapid method for the determination of phenols. J. A. Shaw. *Ind. Eng. Chem., Analytical Edition*, July 15, pp. 118–121.

Modification of Parr's total carbon determination in coal. R. E. Brewer and E. P. Harding. *Ind. Eng. Chem., Analytical Edition*, July 15, pp. 145–148.

Quantitative determination of formaldehyde in a pharmaceutical preparation. O. Heim. *Ind. Eng. Chem. Analytical Edition*, July 15, p. 128.

Electrostatic method for determining fusion in bituminous coal. J. D. Davis and J. A. Younkins. *Ind. Eng. Chem., Analytical Edition*, July 15, pp. 165–167.

The vapour pressures of glycerol trinitrate and certain glycol dinitrates. W. de C. Crater. *Ind. Eng. Chem.*, July, pp. 674–676.

CARBOHYDRATES.—The molecular structure of inulin : Isolation of a new anhydrofructose. J. C. Irvine and J. W. Stevenson. *J. Amer. Chem. Soc.*, July, pp. 2197–2203.

GENERAL.—The solubility of calcium carbonate (calcite) in certain aqueous solutions at 25° C. G. L. Frear and J. Johnston. *J. Amer. Chem. Soc.*, July, pp. 2082–2093.

The solubility of magnesium carbonate (nesquehonite) in water at 25° C. and pressures of carbon dioxide up to one atmosphere. W. D. Kline. *J. Amer. Chem. Soc.*, July, pp. 2093–2097.

Extraction of commercial rare-earth residues with a view to the concentration of ilinium. R. W. Ball with J. A. Harris. *J. Amer. Chem. Soc.*, July, pp. 2107–2112.

Air-oxidation of hydrocarbons catalysed by nitrogen oxides. I—Natural Gas. II—Benzene. C. H. Bibb and H. J. Lucas. *Ind. Eng. Chem.*, July 1, pp. 633–635. In the partial oxidation of natural gas by air, the low concentration of nitric acid obtained by passing the gas through concentrated nitric acid at room temperature is an effective catalyst. Under some conditions a 4 per cent. conversion of the hydrocarbons to formaldehyde has been realised ; under other conditions a condensate containing 25 per cent. formaldehyde has been obtained.

RUBBER.—Dispersion of pigments in rubber. II. E. A. Grenquist. *Ind. Eng. Chem.*, July, pp. 665–669. A theoretical conception of the reinforcement of rubber by pigments has been developed. New experimental evidence has been presented which leads to a better understanding of the final dispersion and reinforcement of a rubber compound. It is shown that pigment reinforcement is influencced by (*a*) rubber structure, (*b*) the state of aggregation of proteins and natural resins, (*c*) the isotropic properties of carbon-black particles, and (*d*) the presence of recrystallised rhombic sulphur at the beginning of vulcanisation.

Importance of temperature and humidity control in rubber testing. II. Resistance to abrasion. W. A. Gibbons *et al. Ind. Eng. Chem., Analytical Edition*, July 15, pp. 174–180.

SUGAR REFINING.—The use of super-cel in the sugar refining industry. A. Elsenbast, R. D. Elliott, and E. J. Sullivan. *Ind. Eng. Chem.*, July pp. 676–684.

German

ANALYSIS.—The bromimetric and thiocyanimetric determination of ethereal oils. II.—H. P. Kaufmann. *Archiv. Pharmazie*, April, pp. 249–267.

APPARATUS.—A nitrometer without rubber tubing, for semi-microchemical working. E. Berl, K. Hofmann, and R. Bemmann. *Chemische Fabrik*, August 7, pp. 359–360.

COAL DISTILLATION.—The development and present position of the coal distillation industry in Germany. R. Heinze. *Chemische Fabrik*, May 22, pp. 249–253 ; June 12, pp. 288–290 ; June 19, pp. 297–298 ; June 26, pp. 306–309 ; July 3, pp. 315–318 ; July 24, pp. 345–347 ; July 31, pp. 352–355 ; August 7, pp. 362–363.

GENERAL.—The relations of the physical properties of chemical substances to their action on micro-organisms. T. Sabalitschka. *Archiv Pharmazie*, April, pp. 272–290.

Pure aluminium orthohydroxide in the gelatinous and the finely powdered form. P. A. Thiessen and K. L. Thater. *Zeitschrift anorganische Chem.*, Vol. 181, Part 4, pp. 417–424. The pure hydroxide of aluminium is obtained by decomposition of aluminium triethyl, in absolute alcoholic solution or in the form of vapour, with water.

High-temperature technique and new fluorides. O. Ruff. *Zeitschrift angewandte Chem.*, August 3, pp. 807–810.

A new fluorine-sulphur compound : Sulphur tetrafluoride (preliminary note). J. Fischer and W. Jaencker. *Zeitschrift angewandte Chem.*, August 3, pp. 810–812.

Miscellaneous

DYESTUFFS AND DYEING.—Recent investigations upon the theory of the dyeing of acetate silk. H. Brandenburger. *Melliand Textilberichte, English Edition*, July, pp. 177–179 (in English).

The manufacture of Malachite Green. A. Neuberg. *Zeitschrift für Farbenindustrie*, July, pp. 274–278 (in German).

GENERAL.—The oxidation of carbon monoxide. M. Prettre and P. Laffitte. *Comptes Rendus*, July 22, pp. 177–179 (in French).

The oxidisability of silicon and its solubility in hydrofluoric acid. C. Bedel. *Comptes Rendus*, July 22, pp. 180–182 (in French).

Distillation and rectification of complex mixtures. III. Continuous distillation with a single column : Discontinuous distillation. L. Gay. *Chimie et Industrie*, July, pp. 3–18 (in French).

The active charcoal catalyst (phosgene industry). M. and L. Jacqué. *Chimie et Industrie*, July, pp. 19–23 (in French).

Vanillin from oil of cloves. P. A. Hausmann. *Zeitschrift für Farbenindustrie*, July, pp. 269–272 (in German).

ORGANIC.—The preparation of sodium naphthol-2 : 6-disulphonate (Schaeffer's salt). K. Wend. *Zeitschrift für Farbenindustrie*, July, pp. 272–274 (in German).

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

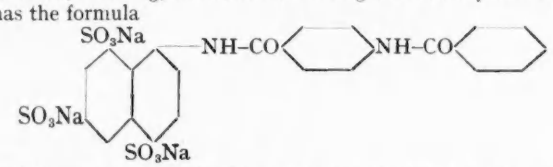
Abstracts of Complete Specifications

314,151. BARIUM PEROXIDE, MANUFACTURE OF. B. Laporte, Ltd., Luton, I. E. Weber, St. Kilda, Cumberland Road, Leagrave, Luton, and V. W. Slater, Avalon, Blenheim Crescent, Luton. Application date, October 6, 1928.

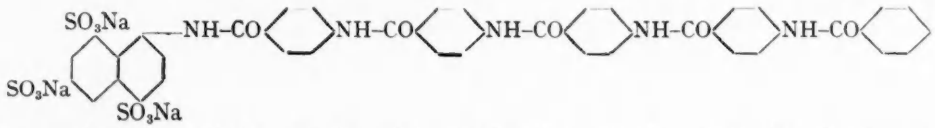
In the manufacture of barium peroxide, barium carbonate is usually heated with a reducing agent to produce barium oxide, which is then oxidised to the peroxide. It is now found that if the barium carbonate is mixed with about 0·2 per cent. of sodium carbonate and then converted into barium oxide in the usual manner, the product is more porous and less liable to crumble, so that it is more easily peroxidised. The necessary sodium carbonate may be added to the previously formed barium carbonate, or the barium carbonate may be produced in the presence of an alkali salt so that the precipitate retains some of the alkali salt.

315,200. DERIVATIVES OF THE BENZENE, NAPHTHALENE, AND ACENAPHTHENE SERIES, MANUFACTURE OF. L. J. Hooley, J. Thomas, and Scottish Dyes, Ltd., Earl's Road, Grangemouth, Stirling. Application date, January 3, 1928.

Sulphonated aromatic amines of the benzene, naphthalene and acenaphthene series are submitted one or more times to the process of condensing with a nitro aromatic acidyl chloride, the product being reduced to the corresponding amine after each condensation. The final product is condensed with an aliphatic or aromatic acidyl chloride which does not contain a nitro group. The product obtained by condensing 1-naphthylamine-4:6:8-trisulphonic acid with paranitro-benzoyl-chloride, reducing, and then condensing with benzoyl chloride has the formula



and the product obtained by repeating the first condensation and reduction a number of times followed by condensation of the product with benzoyl chloride has the formula



An example is given of the production of benzoyl-*p*-amino-benzoyl-*p*-amino-benzoyl-*p*-amino-benzoyl-*p*-amino-benzoyl-1-amino-naphthalene-4:6:8-trisulphonic acid and intermediate products, and several other similar condensations.

315,249. UNSATURATED HYDROCARBONS, PRODUCTION OF. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, April 10, 1928.

Higher olefines and diolefines which are mainly gaseous, such as butadiene, are obtained in addition to acetylene from lower members of the olefine series, particularly ethylene, or gases obtained in cracking processes by exposing the gases to high temperature electrical discharges at a pressure which may vary from below atmospheric to 50 atmospheres. The composition of the resulting gas mixture depends on the rate of flow of the gases and the amount of electric energy introduced. As the rate of flow increases, the proportion of acetylene obtained decreases and the proportion of butadiene increases. Ethylene may be replaced by butylene or propylene. An example is given of the treatment of ethylene to yield about 11 per cent. of butadiene.

315,328. DYESTUFFS, PRODUCTION OF. R. S. Barnes, J. E. G. Harris, B. Wylam, J. Thomas and Scottish Dyes, Ltd., Earl's Road, Grangemouth, Scotland. Application dates, January 9 and 16, 1928.

Derivatives are obtained from anthraquinone arylido ortho-carboxylic acids and their leuco compounds, whether the carboxylic group be in the side chain or in the nucleus, by treating with sulphuric anhydride compounds of tertiary bases in the presence of a tertiary base or non-basic organic solvent at a raised temperature. The sulphuric anhydride compound may be pyridine sulphuric anhydride. Examples are given of the treatment of 1-β-naphthylamino-anthraquinone-2-carboxylic acid and 1-anilido-anthraquinone-2-carboxylic acid.

315,331. NAPHTHALENE DERIVATIVES, MANUFACTURE OF. British Celanese, Ltd., 22 and 23, Hanover Square, London, W.1, G. H. Ellis, H. C. Olpin, and E. W. Kirk, of British Celanese, Ltd., Spondon, near Derby. Application date, February 7, 1928.

The process is for the synthesis of 5:8-dihydroxy-1:4-naphtho-quinone and other 1:4-naphthoquinone derivatives by ring closure by means of dehydrating agents and simultaneous oxidation of 2:5-disubstituted β-benzoyl-propionic acids or derivatives having a free 6-position in the benzene nucleus. Sulphuric acid with or without boric acid may be used for the ring closure and oxidation. The β-benzoyl-propionic acid derivative is obtained by condensation of succinic anhydride or a derivative with a para-di-substituted benzene derivative having two positions ortho to each other free. The condensation ring closure and oxidation can be effected in one operation by means of a mixture of boric acid and sulphuric acid. The benzene derivatives referred to include 1:4-dihydroxy-benzene, 1-methyl-2:5-dihydroxy-benzene, 1:2-dimethyl-3:6-dihydroxy-benzene, *p*-amino-phenol, *p*-chlor-phenol, and 3:4-dichlor phenol.

315,439. DESULPHURISATION OF HYDROCARBONS. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, January 14, 1928.

Crude hydrocarbons are treated with hydrogen or gases containing it at elevated temperatures and pressure in the presence of metallic sulphides which are stable under these conditions. The conditions are such that no substantial hydrogenation occurs, *i.e.*, the temperature may be 200°-300° C., and the pressure 50–100 atmospheres. The sulphides may be mixed with activators such as the oxides of metals of the fourth to eighth group of the periodic system. Examples are given of the purification of benzene and naphthalene.

315,459. TREATING METALLIC OXIDES OR OTHER COMPOUNDS WITH HYDROCARBONS. H. Wade, London. From Società Italiana per le Industrie Minerarie e Chimiche, 26, Piazza Fontane, Marose, Genova, Italy. Application date, April 13, 1928.

Distillation residues of petroleum are heated and the vapour is passed over iron oxide or the residue from the calcination of iron pyrites heated to 400°–700° C. The oxide is reduced with the formation of water and oxides of carbon, coke and light liquid and gaseous hydrocarbons. The reduced iron is separated electro-magnetically. The hydrocarbon vapours are condensed, and the residual gases purified and passed back to the reaction chamber.

315,485. MIXED FERTILISERS, PRODUCTION OF. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application dates, April 18 and 27, October 6 and 8, 1928.

An aqueous solution of calcium or magnesium nitrate is concentrated and solid potassium nitrate is added. It is found that large quantities of potassium nitrate can be dissolved, and the resulting mixed solution can be converted into a solid product by spraying or by passing over heated

rollers. The mixed fertiliser thus obtained is stable when stored, and is readily distributed. Any desired ratio of potash to nitrate can be obtained, and phosphoric salts may be added if desired. The calcium or magnesium nitrate may be replaced by ammonium nitrate or urea to obtain a more concentrated fertiliser. The ratio of nitrogen to potash (K_2O) may vary from 1:1 to 1:2·7.

315,554. Vulcanised Rubber, Production of. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, June 22, 1928.

The properties of vulcanised rubber, particularly resistance to attrition, can be improved by adding selenium-sulphur compounds in the form of a paste obtained by triturating the powder with oily or fatty substances such as solid or oily petroleum jelly, stearic acid, oleic acid, or wool fat. Accelerating agents such as diphenyl-guanidine and anti-ageing substances such as aldol α-naphthylamine, may be added. The proportion of selenium-sulphur compound may be 0·5–1 per cent., and the strength of the vulcanised rubber may be increased by 40 per cent.

315,595. Butadiene, Production of. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, August 11, 1928.

A good yield of butadiene is obtained by passing the vapour of 1:3-butylene glycol over red phosphorus distributed over a dehydrating catalyst such as sodium phosphate or potassium aluminium sulphate, or over dispersing agents such as pumice stone or porcelain balls. The temperature is preferably 275°–325° C. and a yield of 99 per cent. of butadiene can be obtained.

Note.—Abstracts of the following specifications which are now accepted, appeared in The Chemical Age when they became open to inspection under the International Convention: —288,555 (I.G. Farbenindustrie Akt.-Ges.) relating to basic phenol alkyl ethers, see Vol. XVIII, p. 555; 288,977 (I.G. Farbenindustrie Akt.-Ges.) relating to gas purification and production of metal sulphates from sulphides, see Vol. XVIII, p. 581; 293,754 (T. Goldschmidt Akt.-Ges) relating to transforming olefines into alkylene chlorhydrins, see Vol. XIX, p. 243; 294,582 (Soc. of Chemical Industry in Basle) relating to quarternary ammonium compounds, see Vol. XIX, p. 323; 295,270 and 300,968 (Selden Co.) relating to catalytic oxidation of organic compounds, see Vol. XIX, p. 347 and Vol. XX, p. 82; 306,803 (Selden Co.) relating to catalytic hydrogenation of non-nitrogenous organic compounds, see Vol. XX, p. 454.

International Specifications not yet Accepted

313,409. Aluminium Oxide. Vereinigte Aluminium-Werke Akt.-Ges., Lautawerk, Lausitz, Germany. International Convention date, June 9, 1928.

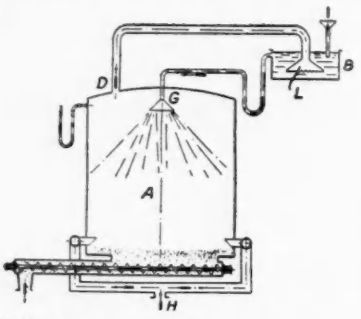
Bauxite and pyrites are smelted with coal and the molten slag containing aluminium oxide and sulphide is chilled by a current of gas or steam, or by being delivered into water or on to a cooled moving iron plate, or into a cooled rotating drum, or into molten aluminium. The oxide is thereby obtained in a fine state of division.

313,493. Dyes and Intermediates. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, June 12, 1928.

Thioindigo dyestuffs of the thionaphthene indol series are obtained by coupling 5-halogen-3-oxythionaphthene with an active α-derivative of a halogenated isatin. The α-chloride of 5:7-dibromisatin may be obtained by treating it with phosphorus pentachloride. To obtain 5-halogen-3-oxythionaphthene, chlorbenzene is treated with chlorsulphonic acid to obtain *p*-chlorbenzene sulphochloride, *p*-chlorphenyl-mercaptan is obtained by reduction, and is then coupled with chloracetic acid to obtain *p*-chlorphenyl-thioglycollic acid. This is converted into the acid chloride, and the ring closed by means of aluminium chloride to obtain 5-chlor-3-oxythionaphthene.

313,446. Ammonium Salts. Montecatini Soc. Generale per l'Industria Mineraria e Agricola, 18, Via Principe Umberto, Milan, Italy. (Assignees of G. Fauser, 4, Via Barazzuolo, Novara, Italy). International Convention date, June 11, 1928. Addition to 292,129. (See The Chemical Age, Vol. XIX, p. 145.)

Dry ammonium salts are obtained by spraying acid into an atmosphere of ammonia in a chamber A. Dry ammonia is



313,446

supplied through a pipe H, and vapour passes out of the chamber through a pipe D to a bell L in the acid tank B which supplies the atomiser G.

313,486. Indiarubber. Goodyear Tire and Rubber Co., 1144, East Market Street, Akron, Ohio, U.S.A. (Assignees of A.M. Clifford, 649 Honodle Avenue, Akron, Ohio, U.S.A.) International Convention date, June 12, 1928.

Anilido naphthoquinones of the type

where R^1 is an aromatic group, are used as antiagers in rubber vulcanisation. Substitution in the 2-position may be made by hydroxy or amine groups. Examples are given.

313,505. Destructive Hydrogenation. Holzverkohlungs Industrie Akt.-Ges., Konstanz, Baden, Germany, and J. Varga, 4, Gellért Ter, Budapest. International Convention date, June 12, 1928.

Carbonaceous materials are treated with hydrogen at high temperature and pressure in the presence of 1–12 per cent. of hydrogen sulphide and molybdenum or tungsten or their compounds. Activators such as boric acid or chromium compounds may be added. The products are saturated aliphatic, aromatic, and hydroaromatic hydrocarbons, free from oxygen, sulphur, and nitrogen, and are sufficiently pure for use as motor fuels.

313,562. Dyes. Chemische Fabrik vorm. Sandoz, Basle, Switzerland. International Convention date, June 14, 1928.

Mixed wool and viscose goods are dyed black shades by means of azo dyes obtained by coupling a tetrazotised diaryldiamine with H-acid in acid solution, and combining the product with a monodiazo compound and an N-alkyl-, aryl- or aralkyl-*m*-amino-phenol or a derivative in alkaline solution.

313,575. Catalytic Reactions. E. I. du Pont de Nemours and Co., Wilmington, Del., U.S.A. (Assignees of W. A. Lazier, 107, Winston Avenue, Elmhurst, Wilmington, Del., U.S.A.) International Convention date, June 14, 1928.

Esters are obtained by passing alcohol over a catalyst at 375°-425° C., consisting of a difficultly reducible dehydrogenating oxide, chromite, or chromate, with or without a more acidic oxide such as oxides of vanadium, chromium, tungsten, molybdenum or uranium as a promoter. Thus, butyl alcohol may be passed over manganese oxide at 400° C., giving equal amounts of butyraldehyde and butyl butyrate. Methyl alcohol passed over magnesium oxide, cadmium oxide and chromium oxide at 350° C. yields formaldehyde and methyl formate. Ethyl alcohol passed over reduced basic zinc ammonium chromate yields acetaldehyde and ethyl acetate. A number of examples are given of the production of suitable catalysts.

LATEST NOTIFICATIONS.

316,275. Mouldable resin composition containing a fabric filler. Bakelite Corporation. July 27, 1928.

316,174. Process of treating coke oven gases and like gases. Union Chimique Belge Soc. Anon. July 24, 1928.

316,276. Process for the surface treatment of celluloid articles to render the same practically uninflammable. Weber, A., Höppner, jun., H., and Weich, H. July 27, 1928.

316,277. Process for the production of photographic plates, films, papers, and the like for photographics and copies in natural colours by means of dye substances decoloured or partly decoloured and recoloured again. Larsen, W. R. B. July 28, 1928.

316,278. Process for the removal of ammonia, sulphuretted hydrogen, and cyanogen compounds from gases. Hansen, Dr. C. J. July 28, 1928.

316,126. Process for the production of higher hydrocarbons. Fischer, Dr. F., and Pichler, H. July 23, 1928.

316,282. Manufacture of condensation products from acetylene. I.G. Farbenindustrie Akt.-Ges. July 27, 1928.

316,208. Process of improving the resistance to corrosion of magnesium and magnesium alloys. I.G. Farbenindustrie Akt.-Ges. July 25, 1928.

316,284. Process for the extraction of acetic acid from pyroligneous acid. Distilleries des Deux-Sèvres. July 28, 1928.

316,287. Manufacture of acetic acid and lactic acid by fermentation. Distilleries des Deux-Sèvres. July 27, 1928.

316,251. Oxidizable organic compounds. Goodyear Tire and Rubber Co. July 26, 1928.

316,177. Method of treating tin-containing material. Mitsubishi Kogyo Kabushiki Kaisha. July 24, 1928.

316,134. Manufacture of vessels and other structures that are proof against chemical and atmospheric influences. Pick, P. July 23, 1928.

316,136. Manufacture of phosphate compounds. Victor Chemica Works. July 23, 1928.

316,137. Process for refining hydrocarbons. Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. July 23, 1928.

316,222. Activation of carbonaceous substances by means of gases. Soc. de Recherches et d'Exploitations Petroliferes. July 25, 1928.

316,143. Process for the manufacture of hydroxy-1[1]: 8[1] naphthoylene-naphthimidazoles or derivatives thereof. I.G. Farbenindustrie Akt.-Ges. July 23, 1928.

316,144. Production of condensation products of urea. Goldschmidt, Dr. S., and Mayrhofer, Dr. R. July 23, 1928.

316,149. Process for the purification of vat dyestuffs of the anthanthrone series. I.G. Farbenindustrie Akt.-Ges. July 23, 1928.

316,151. Bleaching or otherwise treating fibrous material. Ehrenthal, Dr. B. P. Von, and Scholz, K. July 23, 1928.

316,195. Manufacture of guanidine derivatives. Soc. of Chemical Industry in Basle. July 24, 1928.

316,265. Bleaching and dyeing of jute, hemp, and like fibrous materials. Robertson, T. E. July 26, 1928.

316,268. Process for the manufacture of ortho-hydroxy azo dyestuffs containing chromium. I.G. Farbenindustrie Akt.-Ges. July 26, 1928.

316,269. Process for regenerating activated charcoal used for dechlorinating water. Pick, H. July 26, 1928.

316,271. Method of de-waxing oils. Oliver United Filters, Inc. July 26, 1928.

316,315. Manufacture of basic dyestuffs. Durand and Huguenin Akt.-Ges. July 28, 1928.

316,316. Process for producing colour resists under aniline black. I.G. Farbenindustrie Akt.-Ges. July 28, 1928.

316,274. Process for the treatment of waste products from petroleum refining. I.G. Farbenindustrie Akt.-Ges. July 26, 1928.

316,319. Resinous condensation products. British Thomson-Houston Co., Ltd. July 27, 1928.

316,321. Coating-compositions, particularly coating-compositions containing cellulose derivatives. Imperial Chemical Industries, Ltd. July 27, 1928.

316,322. Coating-compositions, particularly coating compositions containing cellulose derivatives. Imperial Chemical Industries, Ltd. July 27, 1928.

316,323. Art of coating-compositions and more particularly coating-compositions containing cellulose acetate. Imperial Chemical Industries, Ltd. July 27, 1928.

316,324. Art of esters of dibasic acids, particularly esters of polyhydroxy compounds containing at least two free hydroxyl groups. Imperial Chemical Industries, Ltd. July 27, 1928.

316,325. Art of synthetic resins, particularly synthetic resins containing ether groups and compositions made therewith. Imperial Chemical Industries, Ltd. July 27, 1928.

316,520. Apparatus for the distillation and cracking of oils. Fachini, G. July 27, 1928.

316,521. Treatment of materials containing cellulose esters. British Celanese, Ltd. July 28, 1928.

316,858. Hardening of condensation products from phenols and aldehydes. Schmidt, Dr. F. August 3, 1928.

316,538. Process for the production of lac products. Scheiber, J July 30, 1928.

316,605. Process for the simultaneous production of precipitated dicalcium phosphate and nitrates. Palazzo, F. C., and Palazzo, F. August 1, 1928.

316,542. Purifying of natural heavy spar. Sachtleben Akt.-Ges. für Bergbau und Chemische Industrie. July 30, 1928.

316,547. Preparation of unsaturated esters. Röhm and Haas Akt.-Ges. July 30, 1928.

316,548. Production of alkali sulphates. Chemieverfahren Ges. July 30, 1928.

316,664. Mixtures of nitrate of ammonia and nitrate of lime. Appareils et Evaporateurs Kestner. August 2, 1928.

316,870. Activation of carbonaceous substances by means of gases. Soc. de Recherches et d'Exploitations Petrolifères. August 4, 1928.

316,550. Process for producing monocalcium phosphate and mixtures of mono- and di-calcium phosphate. Palazzo, F. C. and Palazzo, F. July 30, 1928.

316,552. Vaporisation of heavy hydrocarbons. Compagnie Internationale pour la Fabrication des Essences et Petroles. July 30, 1928.

316,583. Method of producing dicalcium fertilisers. Holz, A. July 31, 1928.

316,563. Production of diazo-type prints. Kalle and Co. Akt.-Ges. July 30, 1928.

316,626. Process for the electric purification of gases containing hot vapours. Siemens-Schuckertwerke Akt.-Ges. August 1, 1928.

316,881. Treatment of substances containing oils, fats, or other extractable substances. Schlotterhose, C., and Brandt, H. August 4, 1928.

316,888. Process for separating acetylene from mixtures of gases. Soc. of Chemical Industry in Basle. August 4, 1928.

316,684. Concentration of nitric acid. Imperial Chemical Industries, Ltd. August 2, 1928.

Specifications Accepted with Date of Application

288,986. Hydroxythionaphthenes, Manufacture of. I.G. Farbenindustrie Akt.-Ges. April 16, 1927.

289,092. Dyestuffs of the diaminotriphenyl-methane series, Manufacture of. I.G. Farbenindustrie Akt.-Ges. April 23, 1927.

289,777. Crotyl bromide, Manufacture of. I.G. Farbenindustrie Akt.-Ges. April 30, 1927.

289,807. Dyestuffs of the anthraquinone series, Manufacture of. I.G. Farbenindustrie Akt.-Ges. May 2, 1927.

292,595. Condensation products from urea, thiourea, or their derivatives, and an alcohol or a ketone, Manufacture of. I.G. Farbenindustrie Akt.-Ges. June 11, 1928. Addition to 278,390, 280,238, 287,045, and 290,192.

296,006. Amino-alkyl-arylcarbinols or N-alkylamino-alkylarylcarbinols, Manufacture of. Soc. of Chemical Industry in Basle. August 22, 1927.

296,761. Sulphur-containing hydroxy-quinones, Manufacture of. I.G. Farbenindustrie Akt.-Ges. September 7, 1927.

297,002. Vat-dyestuffs and an intermediate, product, Manufacture of. Soc. of Chemical Industry in Basle. September 9, 1927.

299,773. Lead-bearing metals containing nickel and copper. E. Abel. October 31, 1927.

301,808. 4-(β-oxyethylamino)-1-oxybenzene, Manufacture of. I.G. Farbenindustrie Akt.-Ges. December 5, 1927.

302,881. Partitions for separating the electrolytic products in the fusion electrolysis of chlorides, particularly of magnesium. I.G. Farbenindustrie Akt.-Ges. December 23, 1927

304,744. Azo-dyestuffs, Manufacture of. I.G. Farbenindustrie Akt.-Ges. January 26, 1928. Addition to 287,908.

305,092. Obtaining pure hydroxides of the heavy metals, Process of. Accumulatoren Fabrik Akt.-Ges. January 30, 1928.

305,201. Vanadium alloys. Vanadium Corporation of America. February 2, 1928.

316,063. Ores, metallurgical products, residues, and the like. Treatment of—for the recovery of precious metals. A R. Powell, E. C. Deering, and Johnson, Matthey and Co., Ltd. May 1, 1928.

316,113. Catalysts for the production of methanol and higher alcohols, Manufacture of. H. G. Smith, R. G. Franklin, and Imperial Chemical Industries, Ltd. April 20, 1928.

316,156. Vat dyestuffs, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) February 24, 1928.

316,158. Hydroxy-aliphatic acids, Manufacture of. H. Dreyfus. March 24, 1928.

316,159. Hydroxyaliphatic carboxylic acids, and the salts thereof, Manufacture of. H. Dreyfus. April 18, 1928.

316,164. Acid resisting iron alloys. L. Kluger, and Oesterreichische Schmidtstahlwerke Akt-Ges. April 20, 1928.

316,172. Condensation products and vat dyestuffs of the benzanthrone series, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) March 24, 1928.

316,198. Complex chromium compounds of azo dyestuffs, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) March 19, 1928.

316,231. Chromiferous dyestuffs, Manufacture of. I.G. Farbenindustrie Akt.-Ges. January 23, 1928. Addition to 269,522.
316,320. Decarburizing ferro-alloys, Process of. H. E. Potts. (*Electro-Metallurgical Co.*) March 27, 1928.
316,370. Organic salts of dyestuffs, Manufacture of. I.G. Farbenindustrie Akt.-Ges., G. Kranzlein, C. Hartmann, and A. Hardt. May 22, 1928. Addition to 277,371.
316,399. Hydrogenation of aldehydes. G. F. Horsley and Imperial Chemical Industries, Ltd. June 29, 1928.
316,404. Oxide iron ores, Treatment of. W. S. Millar. July 3, 1928.
316,422. Valuable hydrocarbons, Production of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) July- 13, 1928.
316,428. Fertilisers, Manufacture of. K. Gordon and Imperial Chemical Industries, Ltd. July 19, 1928.
316,444. Salts of aromatic hydroxy-aldehydes, Production of. Graesser-Monsanto Chemical Works, Ltd., and D. P. Hudson. August 4, 1928.
316,447. Calcium hypochlorite, Manufactue of. L. Mellersh-Jackson. (*Mathieson Alkali Works.*) August 18, 1928.
306,442. Catalytic apparatus. Selden Co. February 20, 1928.

Applications for Patents

American Potash and Chemical Corporation. Borax product. 23,795. August 2. (United States, April 9.)
Arnold, C., and Harshaw Chemical Co. Effecting chemical reactions. 23,424. July 30.
Autogenwerk Sirius Ges. Preparing gases by interaction of solids and liquids. 24,295. August 8. (Germany, February 22.)
—— Production of gases from carbides and water. 24,296. August 8. (Germany, May 15.)
Banner, C. G. Wax compositions. 23,601. August 1.
Bataafsche Petroleum Maatschappij, and Elkington, H. D. Manufacture of ethers. 23,648. August 1.
—— Preparation of organic compounds. 23,971. August 6.
—— Manufacture of alcohols. 24,157. August 7.
—— Manufacture of anhydrides of organic acids. 24,436. August 9.
Bataafsche Petroleum Maatschappij. Treatment of hydrocarbons. 23,373. July 30. (Holland, October 23, 1928.)
Berdell, T. van D., and Holz, A. Fertilisers. 23,398, 23,400, 23,401. July 30.
—— Production of di-calcium phosphate. 23,399. July 30.
—— Plant-foods. 23,402. July 30.
Bernstein, A. Treatment of cellulose. 23,245. July 29.
Brandt, H., Schlotterhose, C., and Schlotterhose and Co., C. Treatment of substances containing oils, fats, etc. 23,637. August 1. (Germany, August 4, 1928.)
—— Treatment of substances containing oils, fats, etc. 23,790. August 2. (Germany, March 28.)
British Celanese, Ltd. Manufacture of artificial materials. 23,267. July 29.
—— Treatment of materials containing cellulose esters. 23,310. July 29. (United States, July 28, 1928.)
—— Plastic compositions. 23,657. August 1. (United States, August 16, 1928.)
Brownlow, H. H. Filters and containers for water, etc. 23,351. July 30.
Bunbury, H. M. Manufacture of thermoplastic products from fatty oils. 24,443. August 9.
Bunbury, H. M., and Imperial Chemical Industries, Ltd. Manufacture of thermo-plastic products from fatty oils. 24,317. August 8.
Butler, C., Imperial Chemical Industries, Ltd., and Piggott, H. A. Manufacture of intermediate compounds, etc. 23,693. August 1.
Calvert, J. Treatment of sulphur, etc. 24,082. August 7.
Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of organic mercury compounds. 23,309. July 29.
—— Polymerisation of butadiene 1 : 3 homologues, etc. 23,811. August 2.
—— Manufacture of anhydrous sodium sulphide. 24,038. August 6.
—— Manufacture of hydroxy-di or triaryl-methane compounds. 24,039. August 6.
—— Manufacture of hydroxy-di- or triaryl-methane compounds. 24,187. August 7.
—— Manufacture of plastic wood. 24,188. August 7.
—— Manufacture of finely divided zinc oxide. 24,189. August 7.
—— Manufacture of hydroxy carbazoles, etc. 24,304. August 8.
—— Manufacture of lacquers. 24,305. August 8.
—— Treatment of lyes. 24,306. August 8.
—— Protecting wool, etc., against textile pests. 24,307. August 8.
—— Manufacture of concentrated acetic acid. 24,308. August 8.
—— Manufacture of hydroxy-di- or triaryl-methane compounds. 24,450, 24,452. August 9.
Cellulose Compounds Regd. Manufacture of artificial silk. 23,780, 23,781. August 2.
Coley, H. E. Production of zinc. 24,272. August 8.
—— Manufacture of zinc, etc. 24,396. August 9.
Compagnie de Produits Chimiques et Electro-Métallurgiques Alais, Froges, et Camargue. Preparation of amines. 23,265. July 29. (France, August 10, 1928.)
—— Preparation of amines. 23,391. July 30. (France, January 26.)
Compagnie Générale des Produits de Synthèse. Synthetic liquid fuels. 23,854. August 2. (France, August 6, 1928.)
Dreyfus, H. Products obtained from cellulose. 23,806. August 2.
—— Treatment of cellulose. 23,807. August 2.
—— Manufacture of cellulose derivatives. 23,808. August 2.
E.M.S. Industrial Processes, Ltd., and Salerni, E. M. Heat treatment of carbonaceous, etc., materials. 23,439. July 30.
E.M.S. Industrial Processes, Ltd., Roberts, E. G. L., and Stokes, R. A. Apparatus for distillation of volatile metals. 23,923. August 3.
Evans, T. A. Production of metal, etc., by reduction. 23,481. July 31.
Fachini, G. Apparatus for distillation, etc., of oils. 23,299. July 29. (Italy, July 27, 1928.)
Ges. für Industriegasverwertung. Transporting and using liquefied gases of low boiling point in closed pressure vessels. 23,320. July 29. (Germany, August 6, 1928.)
Gibbs, W. E. Treatment of waste gases containing oxides, etc. 23,350. July 30.
Hercules Powder Co. Apparatus for digestion of nitrocellulose. 23,449. July 30. (United States, May 29.)
Heyl, G. E. Cellulose-derivative compositions. 23,383. July 30.
Hill, R., and Imperial Chemical Industries, Ltd. Manufacture of resinous compounds. 23,922. August 3.
Holz, A. Production of dicalcium fertilisers. 23,403. July 30. (United States, July 31, 1928.)
I.G. Farbenindustrie Akt.-Ges. Manufacture of valuable gases, etc. 23,565. July 31. (Germany, September 25, 1928.)
—— Preparation of physiologically active substances. 23,675. August 1. (Germany, August 4, 1928.)
I.G. Farbenindustrie Akt.-Ges, and Johnson, J. Y. Production of continuously-burning electric arcs. 23,268. July 29.
—— Treating urea melts. 23,269. July 29.
—— Obtaining pure sulphur. 23,270. July 29.
—— Coating-materials. 23,271. July 29.
—— Manufacture of artificial resins. 23,272. July 29.
—— Loosening rusted, etc., parts of apparatus. 23,273. July 29.
—— Manufacture of vat dyestuffs. 23,274. July 29.
—— Recovery of unsaturated hydrocarbons, etc., from mixtures. 23,428. July 30.
—— Manufacture of iodo-halogen anthanthrones. 23,487. July 31. (October 29, 1928.)
—— Production of fertilisers. 23,660. August 1. (April 29.)
—— Manufacture of nitrogenous vat dyestuffs. 23,829. August 2. (October 15, 1928.)
—— Apparatus for extraction of oils. 23,830. August 2.
—— Manufacture of polymerisation products of diolefines. 23,831. August 2.
—— Carrying out chemical reactions. 23,832. August 2.
—— Manufacture of amides from fats or oils. 23,833. August 2.
Imperial Chemical Industries, Ltd., and Rogers, F. E. Apparatus for degreasing materials. 23,615. August 1.
Jackson, L. Mellersh-, and Soc. l'Air Liquide, Soc. Anon. pour l'Etude et l'Exploitation des Procédés G. Claude. Manufacture of carbonic ice. 23,687. August 1.
Kalle and Co. Akt.-Ges. Production of diazo-type prints. 23,412. July 30. (Germany, July 30, 1928.)
Krebs, E. Manufacture of bleaching-powder. 23,444. July 30.
Mann, W. Manufacture of crystalline soda. 23,338. July 30.
Mortimer, J. E. Conversion of liquid carbon dioxide, etc., gases into solid block form. 23,553. July 31.
Potts, H. E. Manufacture of alkali-metal carbonates. 23,602. August 1.
Ripley, R. R., and Schwarz, S. C. Recovery of gas tars from emulsions. 23,226. July 29.
Siemens-Schuckertwerke Akt.-Ges. Increasing degree of moisture of gases. 23,281. July 29. (Germany, June 1.)
—— Electric purification of gases. 23,575. July 31. (Germany, August 1, 1928.)
—— Purifying furnace gases. 23,577. July 31. (Germany, January 9.)
—— Electric purification of gas. 23,669. August 1. (Germany, April 17.)
Smith, A. B., and Smith, C. R. Apparatus for treating and mixing comminuted, etc., materials. 23,723. August 2.
Soc. of Chemical Industry in Basle. Separating acetylene from mixtures of gases. 23,815. August 2. (Germany, August 4, 1928.)
West, E., West, F. J., and West's Gas Improvement Co., Ltd. Retorts for distillation of coal, etc. 23,620, 23,621. August 1.
—— Retorts for carbonisation of coal, etc. 23,622. August 1.
—— Gas-producers. 23,623. August 1.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £30 per ton; powder, £32 per ton; extra fine powder, £34 per ton.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity, strength and locality.

ACID NITRIC, 80° TW.—£21 10s. to £27 per ton, makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts.

BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages free.

BLEACHING POWDER.—Spot, £9 10s. per ton d/d; Contract, £8 10s. per ton d/d, 4-ton lots.

BORAX, COMMERCIAL.—Crystals, £19 10s. to £20 per ton; granulated, £19 per ton; powder, £21 per ton. (Packed in 2 cwt. bags carriage paid any station in Great Britain.)

CALCIUM CHLORIDE (SOLID).—£5 to £5 5s. per ton d/d carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 3d. to 1s. 8d. per gall. pyridinised industrial, 1s. 5d. to 1s. 10d. per gall.; mineralised 2s. 4d. to 2s. 8d. per gall.; 64 O.P., 1d. extra in all cases.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4½d. per lb.

POTASSIUM CHLORATE.—3⅞d. per lb., ex-wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton, ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton carr. paid.

SODIUM BICHROMATE.—3½d. per lb.

SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included; £15 10s. f.o.r. London.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.b. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.b. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—7¾d. to 8d. per lb. Crude 60's, 2s. 5d. per gall.

ACID CRESYLIC 99/100.—2s. 2d. to 2s. 7d. per gall. 97/99.—2s. 1d. to 2s. 2d. per gall. Pale, 95%, 1s. 9d. to 1s. 10d. per gall. Dark, 1s. 6d. to 1s. 7d.

ANTHRACENE.—A quality, 2d. to 2½d. per unit. 40%, £4 10s. per ton.

ANTHRACENE OIL, STRAINED, 1080/1090.—4¾d. to 5¼d. per gall. 1100, 5¼d. to 6d. per gall.; 1110, 6d. to 6¼d. per gall. Unstrained (Prices only nominal).

BENZOLE.—Prices at works: Crude, 10d. to 11d. per gall.; Standard Motor, 1s. 5d. to 1s. 6d. per gall.; 90%, 1s. 7d. to 1s. 8d. per gall; Pure, 1s. 10d. to 1s. 11d. per gall.

TOLUOLE.—90%, 1s. 7½d. to 2s. per gall. Firm. Pure, 2s. to 2s. 2d. per gall.

XYLOL.—1s. 5d. to 1s. 10d. per gall. Pure, 1s. 8d. to 2s. 1d. per gall.

CREOSOTE.—Cresylic, 20/24%, 6¾d. to 7d. per gall.; Heavy, 6¼d. to 6⅝d. per gall. Middle oil, 4½d. to 5d. per gall. Standard specification, 3d. to 4d. per gall. Light gravity, 2d. to 2¼d. per gall. ex works. Salty, 7½d. per gall.

NAPHTHA.—Crude, 8d.-8¼d. per gall. Solvent, 90/160, 1s. 3d. to 1s. 3½d. per gall. Solvent, 95/160, 1s. 4d. to 1s. 5d. per gall. Solvent 90/190, 1s. to 1s. 3d. per gall.

NAPHTHALENE, CRUDE.—Drained Creosote Salts, £4 10s. to £5 per ton. Whizzed, £5 per ton. Hot pressed, £8 10s. per ton.

NAPHTHALENE.—Crystals, £12 5s. per ton. Purified Crystals, £14 10s. per ton. Quiet Flaked, £14 to £15 per ton, according to districts.

PITCH.—Medium soft, 45s. per ton, f.o.b., according to district. Nominal.

PYRIDINE.—90/140, 3s. 9d. to 4s. per gall. 90/160, 3s. 6d. to 3s. 9d. per gall. 90/180, 1s. 9d. to 2s. 3d. per gall. Heavy, prices only nominal.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. per lb. 100%.

ACID BENZOIC.—1s. 8½d. per lb.

ACID GAMMA.—4s. 6d. per lb.

ACID H.—3s. per lb.

ACID NAPHTHIONIC.—1s. 6d. per lb.

ACID NEVILLE AND WINTHER.—4s. 9d. per lb.

ACID SULPHANILIC.—8½d. per lb.

ANILINE OIL.—8d. per lb. naked at works.

ANILINE SALTS.—8d. per lb. naked at works.

BENZALDEHYDE.—2s. 3d. per lb.

BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.

BENZOIC ACID.—1s. 8½d. per lb.

o-CRESOL 29/31° C.—5½d. per lb.

m-CRESOL 98/100%.—2s. 3d. to 2s. 6d. per lb.

p-CRESOL 32/34° C.—2s. 3d. to 2s. 6d. per lb.

DICHLORANILINE.—1s. 10d. per lb.

DIMETHYLANILINE.—1s. 11d. per lb.

DINITROBENZENE.—8d. per lb. naked at works. £75 per ton.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROTOLUENE.—48/50° C. 7½d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.

DIPHENYLAMINE.—2s. 10d. per lb. d/d.

a-NAPHTHOL.—2s. per lb. d/d.

B-NAPHTHOL.—10d. per lb. d/d.

a-NAPHTHYLAMINE.—1s. 3d. per lb.

B-NAPHTHYLAMINE.—3s. per lb.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. per lb. d/d.

p-NITRANILINE.—1s. 8d. per lb.

NITROBENZENE.—6d. per lb. naked at works.

NITRONAPHTHALENE.—1s. 3d. per lb.

R. SALT.—2s. 2d. per lb.

SODIUM NAPHTHIONATE.—1s. 8½d. per lb. 100% basis d/d.

o-TOLUIDINE.—8d. per lb.

p-TOLUIDINE.—1s. 9d. per lb. naked at works.

m-XYLIDINE ACETATE.—2s. 6d. per lb. 100%.

N. W. ACID.—4s. 9d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £9 15s. to £10 5s. per ton. Grey, £16 10s. to £17 10s. per ton. Liquor, 9d. per gall.

ACETONE.—£78 per ton.

CHARCOAL.—£6 to £8 10s. per ton, according to grade and locality.

IRON LIQUOR.—1s. 3d. per gall. 32° Tw. 1s. per gall. 24° Tw.

RED LIQUOR.—9d. to 10½d. per gall. 16° Tw.

WOOD CRESOTE.—1s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 8d. to 3s. 11d. per gall. Solvent, 4s. to 4s. 3d. per gall.

WOOD TAR.—£3 10s. to £4 10s. per ton.

BROWN SUGAR OF LEAD.—£38 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6½d. to 1s. 3d. per lb. according to quality; Crimson, 1s. 4d. to 1s. 6d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—1s. 10d. to 2s. per lb.

BARYTES.—£5 10s. to £7 per ton, according to quality.

CADMIUM SULPHIDE.—5s. to 6s. per lb.

CARBON BISULPHIDE.—£25 to £27 10s. per ton, according to quantity

CARBON BLACK.—5¼d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£40 to £50 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.

DIPHENYLGUANIDINE.—3s. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—4⅝d. to 5⅞d. per lb.

LAMP BLACK.—£30 per ton, barrels free.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPONE, 30%.—£20 to £22 per ton.

MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton, f.o.r. London.

SULPHUR.—£10 to £13 per ton, according to quality.

SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra

SULPHUR PRECIP. B. P.—£55 to £60 per ton.

THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb., carriage paid.

THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.

VERMILION, PALE OR DEEP.—6s. 6d. to 6s. 9d. per lb.

ZINC SULPHIDE.—8d. to 11d. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£37 per ton ex wharf London, barrels free.

ACID, ACETYL SALICYLIC.—2s. 10½d. per lb, in 1-cwt. lots.

ACID, BENZOIC B.P.—2s. to 3s. 3d. per lb., according to quantity. Solely ex Gum, 1s. 6d. per oz.; 50-oz. lots, 1s. 3d. per oz.

ACID, BORIC B.P.—Crystal, 36s. to 39s. per cwt.; powder, 40s. to 43s. per cwt.; extra fine powder, 42s. per cwt., according to quantity. Carraige paid any station in Great Britain, in ton lots.
ACID, CAMPHORIC.—19s. to 21s. per lb.
ACID, CITRIC.—2s. 0½d. to 2s. 2d. per lb., less 5%.
ACID, GALLIC.—2s. 8d. per lb. for pure crystal, in cwt. lots.
ACID, MOLYBDIC.—5s. 3d. per lb. in ½ cwt. lots. Packages extra. Special prices for quantities and contracts.
ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d.
ACID, SALICYLIC, B.P. PULV.—1s. 5d. to 1s. 7d. per lb. Technical.—10½d. to 11½d. per lb.
ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.
ACID, TARTARIC.—1s. 4½d. per lb., less 5%.
ACETANILIDE.—1s. 5d. to 1s. 8d. per lb. for quantities.
AMIDOL.—7s. 6d. to 9s. per lb., d/d.
AMIDOPYRIN.—7s. 9d. to 8s. per lb.
AMMONIUM BENZOATE.—3s. 3d. to 3s. 9d. per lb., according to quantity. 18s. per lb. ex Gum.
AMMONIUM CARBONATE B.P.—£36 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated, 1s. per lb.
AMMONIUM MOLYBDATE.—4s. 9d. per lb. in ½ cwt. lots. Packages extra. Special prices for quantities and contracts.
ATROPHINE SULPHATE.—9s. per oz.
BARBITONE —5s. 9d. to 6s. per lb.
BENZONAPHTHOL.—3s. to 3s. 3d. per lb. spot.
BISMUTH CARBONATE.—8s. 9d. per lb.
BISMUTH CITRATE.—8s. 3d. per lb.
BISMUTH SALICYLATE.—8s. 3d. per lb.
BISMUTH SUBNITRATE.—7s. 6d. per lb.
BISMUTH NITRATE.—Cryst. 5s. 3d. per lb.
BISMUTH OXIDE.—11s. 3d. per lb.
BISMUTH SUBCHLORIDE.—10s. 3d. per lb.
BISMUTH SUBGALLATE.—7s. 3d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.
BISMUTHI ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s. 0½d. per lb.; 12 W. Qts. 11½d. per lb.; 36 W Qts. 11d. per lb.
BORAX B.P.—Crystal, 24s. to 27s. per cwt.; powder, 25s. to 28s. per cwt., according to quantity. Carriage paid any station in Great Britain, in ton lots.
BROMIDES.—Ammonium, 1s. 11½d. per lb.; potassium, 1s. 8½d. per lb.; granular, 1s. 7¾d. per lb.; sodium, 1s. 10½d. per lb. Prices for 1 cwt. lots.
CALCIUM LACTATE.—B.P., 1s. 2½d. to 1s. 3d. per lb., in 1-cwt. lots.
CAMPHOR.—Refined flowers, 2s. 11d. to 3s. per lb., according to quantity; also special contract prices.
CHLORAL HYDRATE.—3s. 1d. to 3s. 4d. per lb.
CHLOROFORM.—2s. 4½d. to 2s. 7½d. per lb., according to quantity.
CREOSOTE CARBONATE.—6s. per lb.
ETHERS.—S.G. ·730—11d. to 1s. per lb., according to quantity other gravities at proportionate prices.
FORMALDEHYDE, 40%.—37s. per cwt., in barrels, ex wharf.
GUAIACOL CARBONATE.—4s. 6d. to 4s. 9d. per lb.
HEXAMINE.—2s. 3d. to 2s. 6d. per lb.
HOMATROPINE HYDROBROMIDE.—30s. per oz.
HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.
HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. Winchesters, 2s. 11d. per gall. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 4s. per gall.
HYDROQUINONE.—3s. 9d. to 4s. per lb., in cwt. lots.
HYPOPHOSPHITES.—Calcium, 2s. 5d. per lb.; potassium, 2s. 8½d. per lb.; sodium, 2s. 7½d. per lb., in 1 cwt. lots, assorted.
IRON AMMONIUM CITRATE.—B.P., 2s. 8d. to 2s. 11d. per lb. Green, 3s. 1d. to 3s. 4d. per lb. U.S.P., 2s. 9d. to 3s. per lb.
IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.
IRON QUININE CITRATE.—B.P., 8¾d. to 9¼d. per oz., according to quantity.
MAGNESIUM CARBONATE.—Light commercial, £31 per ton net.
MAGNESIUM OXIDE.—Light commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.
MENTHOL.—A.B.R. recrystallised B.P., 19s. 9d. per lb. net; Synthetic, 12s. to 14s. per lb.; Synthetic detached crystals, 12s. to 16s. per lb., according to quantity; Liquid (95%), 9s. per lb.
MERCURIALS B.P.—Up to 1 cwt. lots, Red Oxide, crystals, 8s. 4d. to 8s. 5d. per lb., levig., 7s. 10d. to 7s. 11d. per lb.; Corrosive Sublimate, Lump, 6s. 7d. to 6s. 8d. per lb., Powder, 6s. to 6s. 1d. per lb.; White Precipitate, Lump, 6s. 9d. to 6s. 10d. per lb., Powder, 6s. 10d. to 6s. 11d. per lb., Extra Fine, 6s. 11d. to 7s. per lb.; Calomel, 7s. 2d. to 7s. 3d. per lb.; Yellow Oxide, 7s. 8d. to 7s. 9d. per lb.; Persulph, B.P.C., 6s. 11d. to 7s. per lb.; Sulph. nig., 6s. 8d. to 6s. 9d. per lb. Special prices for larger quantities.
METHYL SALICYLATE.—1s. 5d. to 1s. 8d. per lb.
METHYL SULPHONAL.—18s. 6d. to 20s. per lb.
METOL.—9s. to 11s. 6d. per lb. British make.
PARAFORMALDEHYDE.—1s. 9d. per lb. for 100% powder.
PARALDEHYDE.—1s. 4d. per lb.
PHENACETIN.—3s. 3½d. per lb.
PHENAZONE.—5s. 10d. per lb.
PHENOLPHTHALEIN.—6s. to 6s. 3d. per lb.
POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—102s. per cwt., less 2½ per cent.
POTASSIUM CITRATE.—B.P.C., 2s. 7d. per lb. in 1 cwt. lots.
POTASSIUM FERRICYANIDE.—1s. 9d. per lb., in cwt. lots.
POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb., according to quantity.
POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included f.o.r. London.
POTASSIUM PERMANGANATE.—B.P. crystals, 5½d. per lb., spot.
QUININE SULPHATE.—1s. 8d. to 1s. 9d. per oz., bulk in 100 oz. tins.
RESORCIN.—2s. 10d. to 3s. per lb., spot.
SACCHARIN.—47s. per lb.; in quantity lower.
SALOL.—2s. 3d. to 2s. 6d. per lb.
SODIUM BENZOATE, B.P.—1s. 8d. to 1s. 11d. per lb.
SODIUM CITRATE, B.P.C., 1911.—2s. 4d. per lb., B.P.C. 1923—2s. 7d. per lb. Prices for 1 cwt. lots. U.S.P., 2s. 6d. to 2s. 9d. per lb., according to quantity.
SODIUM FERROCYANIDE.—4d. per lb., carriage paid.
SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.
SODIUM NITROPRUSSIDE.—16s. per lb.
SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—100s. to 105s. per cwt. Crystals, 5s. per cwt. extra.
SODIUM SALICYLATE.—Powder, 2s. 2d. to 2s. 5d. per lb. Crystal, 2s. 3d. to 2s. 6d. per lb.
SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 1d. per lb.
SODIUM SULPHITE, ANHYDROUS.—£27 10s. to £29 10s. per ton, according to quantity. Delivered U.K.
SULPHONAL.—9s. 6d. to 10s. per lb.
TARTAR EMETIC, B.P.—Crystal or powder, 2s. 1d. to 2s. 3d. per lb.
THYMOL.—Puriss., 9s. 1d. to 9s. 4d. per lb., according to quantity. Firmer. Natural, 12s. per lb.

Perfumery Chemicals

ACETOPHENONE.—7s. per lb.
AUBEPINE (EX ANETHOL).—12s. per lb.
AMYL ACETATE.—2s. 6d. per lb.
AMYL BUTYRATE.—5s. per lb.
AMYL SALICYLATE.—2s. 9d. per lb.
ANETHOL (M.P. 21/22° C.).—5s. 6d. per lb.
BENZALDEHYDE FREE FROM CHLORINE.—2s. 3d. per lb.
BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—1s. 10d. per lb.
BENZYL ALCOHOL FREE FROM CHLORINE.—1s. 10d. per lb.
BENZYL BENZOATE.—2s. 3d. per lb.
CINNAMIC ALDEHYDE NATURAL.—14s. per lb.
COUMARIN.—8s. 9d. per lb.
CITRONELLOL.—10s. per lb.
CITRAL.—8s. per lb.
ETHYL CINNAMATE.—6s. 6d. per lb.
ETHYL PHTHALATE.—3s. per lb.
EUGENOL.—12s. per lb.
GERANIOL (PALMAROSA).—21s. per lb.
GERANIOL.—6s. 6d. to 10s. per lb.
HELIOTROPINE.—6s. 9d. per lb.
ISO EUGENOL.—14s. 3d. per lb.
LINALOL.—Ex Bois de Rose, 12s. 6d. per lb. Ex Shui Oil, 10s. per lb.
LINALYL ACETATE.—Ex Bois de Rose, 16s. per lb. Ex Shui Oil, 12s. per lb.
METHYL ANTHRANILATE.—8s. per lb.
METHYL BENZOATE.—4s. per lb.
MUSK KETONE.—34s. per lb.
MUSK XYLOL.—7s. per lb.
NEROLIN.—3s. 9d. per lb.
PHENYL ETHYL ACETATE.—11s. per lb.
PHENYL ETHYL ALCOHOL.—10s. per lb.
RHODINOL.—56s. per lb.
SAFROL.—2s. 6d. per lb.
TERPINEOL.—1s. 6d. per lb.
VANILLIN, EX CLOVE OIL.—17s. 6d. per lb. Ex Guaiacol, 15s. 6d. per lb.

Essential Oils

ALMOND OIL.—Foreign S.P.A., 10s. 6d. per lb.
ANISE OIL.—3s. 6d. per lb.
BERGAMOT OIL.—17s. 6d. per lb.
BOURBON GERANIUM OIL.—22s. per lb.
CANANGA OIL, JAVA.—11s. 6d. per lb.
CASSIA OIL, 80/85%.—6s. 3d. per lb.
CINNAMON OIL LEAF.—7s. 9d. per oz.
CITRONELLA OIL.—Java, 2s. 8d. per lb., c.i.f. U.K. port. Ceylon, pure, 2s. 4d. per lb.
CLOVE OIL (90/92%).—9s. per lb.
EUCALYPTUS OIL, AUSTRALIAN, B.P. 70/75%.—1s. 10d. per lb.
LAVENDER OIL.—Mont Blanc, 38/40%, 16s. per lb.
LEMON OIL.—17s. per lb.
LEMONGRASS OIL.—4s. per lb.
ORANGE OIL, SWEET.—20s. per lb.
OTTO OF ROSE OIL.—Anatolian, 70s. per oz. Bulgarian, 110s. per oz.
PALMA ROSA OIL.—12s. 3d. per lb.
PEPPERMINT OIL.—English, 87s. 6d. per lb.; Wayne County, 14s. 3d. per lb.; Japanese, 7s. per lb.
PETITGRAIN.—8s. 9d. per lb.
SANDALWOOD.—Mysore, 31s. per lb.: 90/95%. 19s. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

London, August 15, 1929.

THERE has been a fair volume of business placed during the current week, although the demand is still a little restricted owing to the holiday season. Prices remain exceptionally steady and the undertone is quite firm. Export business is better.

General Chemicals

ACETONE.—There is no change to report in this market, which continues firm at £75 to £85 per ton, with a steady regular demand.

ACID ACETIC.—Demand continues active, with supplies coming to hand in a more normal manner. Prices are firm at £36 10s. for 80% technical quality.

ACID CITRIC.—There has been a steady demand, with the price firm at 2s. 2d. to 2s. 3d. per lb.

ACID FORMIC.—There has been a steady call at about £41 to £42 per ton for 85% in free carboys.

ACID LACTIC.—Demand is improving, and the product continues firm at £43 per ton for 50% by weight, standard pale quality.

ACID TARTARIC.—There is a larger demand and the price is very firm at 1s. 5d. per lb. less 5%.

ALUMINA SULPHATE.—The market is holding firm at £7 15s. to £8 per ton, with a good demand.

ARSENIC.—Only a small trade is passing at the unchanged price of £16 5s. per tôn, f.o.r. the mines.

BARIUM CHLORIDE.—Stocks are still on the short side, with an active demand; price continues firm at £12 per ton.

CREAM OF TARTAR.—There has been a good demand, with price firm at £100 to £105 per ton for 99/100% B.P. quality.

COPPER SULPHATE.—The market is receiving a brisk demand and the price is a little firmer at about £26 5s. per ton.

FORMALDEHYDE.—There is a satisfactory demand at the unchanged price of £38 per ton.

LEAD ACETATE.—Rather more business is coming to hand, with price firm at £43 10s. for white, and £42 10s. for brown.

LEAD NITRATE.—Steady at £33 15s. per ton.

LIME ACETATE.—In good request at about £18 per ton.

LITHOPONE.—Steady at £19 15s. to £23 per ton, according to quality, and in good request.

METHYL ACETONE.—In satisfactory demand at £58 to £60 per ton.

POTASSIUM CHLORATE.—A little firmer tendency is noticed in this market, with an improving demand; price is firm at £28 to £30 per ton.

POTASSIUM PERMANGANATE.—Good business has been booked and the market remains firm at 5¼d. to 5⅜d. per lb.

POTASSIUM PRUSSIATE.—In active demand at £63 10s. to £65 10s., according to quantity and delivery.

SODIUM ACETATE CRYSTALS.—Demand is somewhat better and standard crystals continue on the short side at the firm rate of £22 10s. to £23 10s.

SODIUM BICHROMATE.—A steady trade is passing at the unchanged rates of 3⅝d. per lb., with discounts for contracts.

SODIUM HYPOSULPHITE.—Photographic crystals are in active request at £14 10s. to £15 per ton.

SODIUM NITRITE.—Demand is maintained at £20 per ton.

SODIUM PHOSPHATE.—More business is being placed with the price unchanged at £12 for dibasic and about £16 10s. for tribasic.

SODIUM PRUSSIATE.—Market is very firm and meets with a good demand at 4¾d. to 5¼d. per lb.

TARTAR EMETIC.—The market is rather firmer and there is an improving demand at 11d. per lb.

ZINC SULPHATE.—Market steady at £12 per ton.

Coal Tar Products

The market for coal tar products is quiet, and prices are unchanged from last week.

MOTOR BENZOL remains at about 1s. 5½d. to 1s. 6d. per gallon, f.o.r. makers' works.

SOLVENT NAPHTHA is unchanged at about 1s. 2d. to 1s. 2½d. per gallon, f.o.r.

HEAVY NAPHTHA is quoted at about 1s. 1d. per gallon, f.o.r.

CREOSOTE OIL remains at 3½d. to 4d. per gallon, on rails in the North, and at 4¾d. per gallon in London.

CRESYLIC ACID is unchanged at about 1s. 10d. per gallon for the 98/100% quality, and at about 1s. 7d. per gallon for the dark quality 95/97%.

NAPHTHALENES are firm, at about £4 10s. per ton for the firelighter quality, at £5 per ton for the 74/76 quality, and at £6 to £6 5s. per ton for the 76/78 quality.

PITCH is unchanged at 40s. to 42s. per ton f.o.b. East Coast.

Nitrogen Products

Sulphate of Ammonia.—The market for sulphate of ammonia remains unchanged at £8 15s. 9d. per ton, f.o.b. U.K. port in single bags for prompt shipment. As usual during this season of the year sales are small.

Home.—The fact that prices have been announced for delivery only until the end of September has caused buyers to hold off because there may be no advantage in their purchasing early.

Nitrate of Soda.—Shipments during the month of July show a considerable advance on July last year, except to the United States. It is understood that large shipments are being made to this country early in August. On account of the price arrangements made with the largest synthetic producers of nitrogen, the price remains unchanged.

Latest Oil Prices

LONDON, August 14.—LINSEED OIL closed steadier at irregular prices. Spot, £37; August, £35 5s.; September, £35 2s. 6d.; September-December, £34 15s.; and January-April, £33 15s., naked. RAPE OIL was quiet. Crude extracted, £41, and technical refined, £43 naked, ex wharf. COTTON OIL was slow. Egyptian crude, £33 10s.; refined common edible, £38, and deodorised, £40, naked, ex mill. TURPENTINE was inactive. American spot to September-December, 42s. 6d. per cwt.

HULL, August 14.—LINSEED OIL.—Spot, £37 5s.; August, £37; September, £36 5s.; September-December, £35 15s. per ton, naked. Business was done in August at £37; September, £36; and September-December, £35 12s. 6d. COTTON OIL.—Egyptian crude, spot, £32 15s.; November-December (new), £29 10s.; edible refined, spot, £36 5s.; technical, spot, £36; deodorised, spot, £38 5s. per ton, naked. PALM KERNEL OIL.—Crushed, 5½ per cent., spot, £35 10s. per ton, naked. GROUNDNUT OIL.—Crushed-extracted, spot, £36 10s.; deodorised, spot, £40 10s. per ton. SOYA OIL.—Extracted, spot, and crushed, spot, £34 10s.; deodorised, spot, £38 per ton. RAPE OIL.—Crushed-extracted, spot, £41 10s.; refined, spot, £43 10s. per ton, net cash terms, ex mill. TURPENTINE, CASTOR OIL and COD OIL unaltered.

South Wales By-Products

SOUTH WALES by-product activities remain unchanged. There has been no expansion of business since the holidays, the general call being small. Pitch values are firmly maintained at the basis of 44s. to 46s. per ton delivered, but there is very little buying. Road tar is quoted from 10s. 6d. to 13s. per 40-gallon barrel, while crude tar is firm round the 25s. to 30s. per ton mark. Refined tars remain fairly bright, a good demand being evident in coke oven and gasworks tars. Naphthas are slow, with values unchanged, while benzol is on offer at 1s. 4½d. to 1s. 7d. per gallon. Patent fuel and coke exports are unchanged. Patent fuel export quotations are:—Ex-ship Cardiff, 21s. to 21s. 6d.; ex-ship Swansea, 20s. to 20s. 6d. per ton. Coke quotations are:—Best foundry, 32s. 6d. to 36s.; good foundry, 26s. 6d. to 32s. 6d., and furnace from 21s. to 22s. per ton. Oil imports over the last four ascertainable weeks amounted to 21,067,021 gallons.

Canadian Production of Sulphate of Ammonia

THE production of ammonium sulphate in Canada during 1928 amounted to 28,090 tons, valued at 1,108,744 dollars, as compared with 24,708 tons, worth 1,030,991 dols. in 1927, states a report recently issued by the Dominion Bureau of Statistics, Ottawa. The whole of the ammonium sulphate made in Canada is produced as a by-product of the coke and artificial gas industries.

The bulk of the Dominion production is exported to foreign countries for use as a fertiliser. In 1928 exports totalled 13,632 tons, valued at 561,696 dols., as compared with 16,947 tons (730,815 dols.) in 1927. The principal countries of destination with the quantities and values of Canadian export to each were as follows:—Japan, 3,248 tons, valued at 135,847 dols.; the United States, 2,997 tons (107,542 dols.); Hong Kong, 3,450 tons (153,646 dols.); China, 1,697 tons (76,891 dols.); Barbados, 498 tons (19,360 dols.); other British West Indies, 306 tons (11,956 dols.); British Guiana, 67 tons (3,002 dols.); Cuba, 854 tons (31,187 dols.); and Newfoundland, 565 tons (22,265 dols.).

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.*

Glasgow, August 14, 1929.

THE heavy chemical market still maintains a good position, a good number of inquiries being received both for home and export business. Prices on the whole remain firm.

Industrial Chemicals

ACETONE.—B.G.S. £76 10s. to £85 per ton ex wharf, according to quantity. Inquiry remains satisfactory.

ACID ACETIC.—This material is still scarce for immediate supply but prices remain unchanged as follows: 98/100% glacial, £56 to £67 per ton according to quality and packing, c.i.f. U.K. Ports; 80% pure, £37 10s. per ton ex wharf; 80% technical, £37 10s. per ton ex wharf.

ACID BORIC.—Crystals, granulated or small flakes, £30 per ton. Powder, £32 per ton, packed in bags carriage paid U.K. stations. There are a few fairly cheap offers made from the Continent.

ACID CARBOLIC ICE CRYSTALS.—In good demand and price increased to about 6¾d. per lb. delivered or f.o.b. U.K. ports.

ACID CITRIC B.P. CRYSTALS.—Quoted 2s. 2d. per lb., less 5% ex store, prompt delivery. Rather cheaper offers for early delivery from the Continent.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. per carboy. Dearsenicated quality, 5s. 6d. per carboy ex works, full wagon loads.

ACID NITRIC, 80° QUALITY.—£24 10s. per ton ex station, full truck loads.

ACID OXALIC, 98/100%.—On offer at about 3¼d. per lb., ex store. Offered from the Continent at 3¼d. per lb., ex wharf.

ACID SULPHURIC.—£2 15s. per ton, ex works for 144° quality, £5 15s. per ton for 168°. Dearsenicated quality, 20s. per ton extra.

ACID TARTARIC, B.P. CRYSTALS.—Spot material now quoted 1s. 4½d. per lb., less 5% ex wharf.

ALUMINA SULPHATE.—Quoted at round about £7 10s. per ton, ex store.

ALUM, LUMP POTASH.—Now quoted £8 7s. 6d. per ton, c.i.f. U.K. ports. Crystal meal about 2s. 6d. per ton less.

AMMONIA ANHYDROUS.—Quoted 7½d. per lb., carriage paid. Containers extra and returnable.

AMMONIA CARBONATE.—Lump quality quoted £36 per ton. Powdered, £38 per ton, packed in 5 cwt. casks delivered U.K. stations or f.o.b. U.K. ports.

AMMONIA LIQUID, 880°.—Unchanged at about 2½d. to 3d. per lb., delivered according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton, c.i.f. U.K. ports.

ANTIMONY OXIDE.—Quoted £35 per ton, c.i.f. U.K. ports. Spot material on offer at about £39 per ton, ex store.

ARSENIC, WHITE POWDERED.—Unchanged at £18 5s. per ton, ex wharf, prompt despatch from mines. Spot material quoted £19 15s. per ton, ex store.

BARIUM CHLORIDE.—Quoted £10 10s. per ton, c.i.f. U.K. ports, prompt shipment.

BLEACHING POWDER.—British manufacturers' contract price to consumers unchanged at £6 12s. 6d. per ton, delivered in minimum 4-ton lots. Continental now offered at about the same figure.

CALCIUM CHLORIDE.—Remains unchanged. British manufacturers' price, £4 5s. per ton to £4 15s. per ton, according to quantity and point of delivery. Continental material on offer at £3 12s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works or £4 12s. 6d. per ton, f.o.b. U.K. ports.

FORMALDEHYDE, 40%.—Remains steady at about £36 10s. per ton, ex store.

GLAUBER SALTS.—English material, quoted £4 10s. per ton, ex station. Continental on offer at about £3 5s. per ton, ex wharf.

LEAD, RED.—Quoted £36 to £36 10s. per ton, according to quantity, delivered buyers' works.

LEAD, WHITE.—Quoted £37 10s. per ton, c.i.f. U.K. ports.

LEAD ACETATE.—White crystals quoted £41 10s. per ton. Brown on offer at about £39 10s. per ton, ex store.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store. In moderate demand.

METHYLATED SPIRIT.—Industrial quality, 64 O.P., quoted 1s. 4d. per gallon, less 2½% delivered.

POTASSIUM BICHROMATE.—Quoted 4⅜d. per lb., delivered U.K. or c.i.f. Irish ports, with an allowance of 2½% for minimum 2½ tons to be taken.

POTASSIUM CARBONATE, 96/98%.—Spot material now quoted £36 10s. per ton, ex store. Offered from the Continent at £25 10s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE, 99¾/100%.—Powder quoted £25 10s. per ton, ex wharf. Crystals 30s. per ton extra.

POTASSIUM NITRATE.—Refined granulated quality quoted £19 2s. 6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton, ex store.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Quoted 5¼d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Spot material quoted 7d. per lb., ex store. Offered for prompt delivery from the Continent at about 6¾d. per lb., ex wharf

SODA, CAUSTIC.—Powdered, 98/99%, £17 10s. per ton in drums; £18 15s. per ton in casks. Solid, 76/77%, £14 10s. per ton in drums, and 70/75%, £14 2s. 6d. per ton in drums, all carriage paid buyers' stations, minimum 4-ton lots, for contracts 10s. per ton less.

SODIUM BICARBONATE.—Refined recrystallised, £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3⅞d. per lb., delivered buyers' premises, with concession for contracts.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station. Powdered or pea quality 27s. 6d. per ton extra. Light soda ash £7 1s. 3d. per ton, ex quay, minimum 4-ton lots, with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £8 17s. 6d. per ton, ex station, minimum 4-ton lots. Pea crystals on offer at £14 15s. per ton, ex station, minimum 4-ton lots. Prices for this year unchanged.

SODIUM NITRATE.—Ordinary quality £10 13s. per ton, carriage paid buyers' sidings, minimum 6-ton lots, with usual extras for smaller quantities and refined qualities.

SODIUM PRUSSIATE.—Spot material on offer at 5½d. per lb., ex, store. Quoted 5⅛d. per lb., ex wharf to go forward.

SODIUM SULPHATE (SALTCAKE).—Prices 50s. per ton, ex works 52s. 6d. per ton delivered for unground quality. Ground quality 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption:—Solid 60/62%, £9 per ton; broken, 60/63%, £10 per ton; crystals, 30/32%, £7 2s. 6d. per ton, delivered buyers' works on contract, minimum 4-ton lots. Special prices for some consumers. Spot material 5s. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 10s. per ton; rock, £10 7s. 6d. per ton; ground American, £9 5s. per ton, ex store.

ZINC CHLORIDE, 98%.—British material now quoted at £22 10s. per ton, f.o.b. U.K. ports.

ZINC SULPHATE.—Offered from the Continent at about £10 5s. per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small quantities

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Developments in Exeter University College

THE commencement of work on the new science buildings for the University College of the South-west, at Streatham, Exeter, represents a milestone in the advancement of technical education in the West. The first instalment of an extensive scheme of university buildings, according to plans made in co-operation with the professors of chemistry and physics, will contain three floors, approximately 300 ft. long by 55 ft. wide, and will cost more than £100,000. The entire top floor of the block will be devoted to chemistry. Of the money required for this new laboratory, £25,000 is the generous gift of Mr. Washington Singer. The amount of research which during the past few years has been published, both by members of the chemistry staff and by post-graduate students under their direction, and the large number of such students who have in recent years obtained positions of responsibility in the world of technical and industrial chemistry, have justified the further provision in the chemical department of a considerable number of smaller laboratories, which will be available solely for the purposes of research work. There will, in fact, be available for chemical workers in the South-west facilities for research at least equal to those provided at any similar institution in the country. The second floor of the science block will be devoted to physics, and the ground floor will contain workshops and dynamo rooms in addition to the lecture and special rooms for physics. On the ground floor, too, provision has been made for a spectroscopic laboratory.

Manchester Chemical Market

(From Our Own Correspondent).

Manchester, August 15, 1929.

More than one instance has been reported here during the past week of reduced deliveries of chemical products against contracts to textile finishing and other works as the direct result of the Lancashire cotton lockout. In other respects the market has been moderately active, with general conditions less dull than they were during Bank Holiday week. For the most part transactions in the spot market relate to small lots, although in the aggregate there has been a fair turnover. So far as prices are concerned, these are steady generally.

Heavy Chemicals

Bichromate of soda is well held and a fair trade is being done on the basis of 3⅝d. per lb. Prussiate of soda also meets with a moderate volume of inquiry, with offers ranging from 4¾d. to 5¼d. per lb., according to quantity. With regard to caustic soda, there is a quietly steady demand about for this material at from £12 15s. to £14 per ton, according to quality. There is not a great deal of business passing in the case of sulphide of sodium, but quotations are well held, the commercial grade selling at about £7 10s. per ton and the 60-65 per cent. concentrated solid at £9. Bicarbonate of soda is firm and in fair request, with British makes quoted on a contract basis of £10 10s. per ton. Chlorate of soda meets with a quiet demand, with prices at from 2⅝d. to 2¾d. per lb. Alkali continues very firm at round £6 per ton, and a fair weight of business is reported in this section of the market. Saltcake has not been particularly active this week but at round £2 10s. per ton values are much the same as before. Hyposulphite of soda is attracting a moderate amount of attention at steady prices; the photographic material is at from £15 to £15 10s. per ton and the commercial quality at round £9. With regard to phosphate of soda, a quiet business is going through in this section, with current offers at from £11 to £11 5s. per ton.

There is a moderate inquiry about for permanganate of potash at steady prices; the commercial grade is at about 5¼d. per lb. and the B.P. at 5½d. A quietly steady demand is reported in the case of yellow prussiate of potash and values are very firm at from 6¾d. to 7¼d. per lb., according to quantity. Although not quotably changed on the week, there seems to be an easy tendency in carbonate of poatsh, the 96-98 per cent. solid quality being on offer at round £25 5s. per ton, ex store. Chlorate of potash is reasonably steady at about 2¾d. per lb., but the demand at the moment is on quiet lines. Bichromate of potash is quoted here at 4¼d. per lb., and a fair amount of business is being done. Caustic potash is attracting some attention and prices are maintained at the recently reduced basis of from £32 10s. per ton, upwards.

Arsenic is steady at round £16 per ton at the mines for white powdered, Cornish makes, and a moderate weight of business has been reported. There has been no further change in the case of sulphate of copper, and prices appear to be pretty stable for the time being at £26 10s. per ton, f.o.b. Only a relatively quiet demand is being met with in the case of nitrate of lead, current values of which are at £33 10s. to £34 per ton. The acetates of lead are quiet but reasonably steady at about £39 per ton for brown and £40 for white. There is a moderate inquiry about for acetate of lime, with grey at £16 10s. per ton and brown at round £8.

Acids and Tar Products

A steady demand is being experienced for acetic acid and quotations in this section are very firm, with the glacial quality at £66 to £67 per ton and the 80 per cent. commercial at £36. Oxalic acid continues rather quiet, but prices are steady at from £1 12s. 6d. to £1 13s. per cwt., ex store. Tartaric acid is firm at the higher level of up to 1s. 5d. per lb., and a fair inquiry is about. Citric is attracting only a limited amount of attention with offers still at round 2s. 1d. per lb.

In the by-products section, pitch quotations are at round £2 5s. per ton, f.o.b., and forward sales are on moderate lines. There has been no apparent improvement in the call for creosote oil, offers of which are at about 2¾d. per gallon, naked, at works. Marked firmness continues to characterise carbolic acid and a steady demand is reported; crystals are at 8d. per lb., f.o.b., and 60's crude at 2s. 3d. per gallon, naked.

Company News

Bradford Dyers' Association.—The board has declared an interim dividend on the ordinary shares at the rate of 10d. per share, subject to income tax. This is a reduction of 2d. per share as compared with the interim dividend for the preceding year, for which period the total dividend was 11¼ per cent., against 10 per cent. for 1927.

International Nickel Co. of Canada.—The company has advanced its annual dividend rate from 80 cents to one dollar. The total earnings for the six months ended June 30 last were $15,688,777, as compared with $7,126,247 for the corresponding period of 1928. The net operating income was $13,259,924, as against $6,165,927, and after allowing $1,471,344, as against $773,551, for depreciation, and $550,402, against $305,854, in respect of interest, retirement system and insurance, there is a profit of $11,238,176, as compared with $5,086,521. Deducting preferred and common dividend payments, there was a balance of $4,664,972, as against $3,145,759. The figures for the six months to June 30, 1929, include those of the Mond Nickel Co.

Australian Commonwealth Carbide Co.—Report for year ended January 31, 1929, states that the number of tons of carbide sold during year was 3,237, giving net profit of £1,991, after charging all expenses, including Australian and United Kingdom income tax and allowing for depreciation charges. Tonnage sold represents over 71 per cent. of total consumption in Commonwealth of Australia. The Bill guaranteeing dividend on preferred ordinary shares for term of five years, although passed unanimously in Lower House of Tasmanian Parliament, was rejected in Upper House. This guarantee had been agreed to as compromise of claims of company against Government for (alleged) misrepresentation in connection with sale of property to company. Failure to implement such compromise revived these claims, and directors were advised, and have decided to take legal steps to enforce them. They have accordingly given instructions that proceedings be instituted in Tasmania against Tasmanian Government. Meeting, Winchester House, E.C.2, Monday, August 19, at 12.15 p.m.

New Chemical Trade Marks

Applications for Registration

This list has been specially compiled for us from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks, and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to September 7, 1929.

Vivadent.

503,959. Class 3. Chemical substances prepared for use in medicine and pharmacy. Thomas Kerfoot and Co., Ltd., Bardsley Vale Mills, Oldham Road, Bardsley, Lancashire; manufacturers of fine chemicals. June 26, 1929. To be associated with No. 503,960 (2,680), xiviii.

Olivita.

504,095. Class 3. Chemical substances prepared for use in medicine and pharmacy. Boots Pure Drug Co., Ltd., 37, Station Street, Nottingham; chemists and druggists. July 1, 1929.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

Antifriction Grease.—The South African Railways and Harbours Administration is calling for tenders, to be presented in South Africa by September 26, 1929, for the supply and delivery of such quantities of antifriction grease as may be required during the period January 1 to December 31, 1930. (Reference number BX. 5555.)

History of Graesser-Monsanto

An Interesting Record of Development

AN account of the origin and growth of the Graesser-Monsanto Chemical Works, Ltd., appears in the August number of *Anglo-American Trade*, from which the following details are taken.

In 1901 an American of Irish stock, John Francis Queeny, started work in a one-man shed in St. Louis, Missouri. He called the firm the Monsanto Co., after his wife's maiden name. Today Monsanto, Illinois, directly opposite the St. Louis plant on the east side of the Mississippi River, is the wealthiest industrial community of its size in the United States. It derives its name from this company—the largest producer of chemicals in the Mississippi valley. The Monsanto, Illinois, plant consists of more than 50 buildings, occupying 60 acres out of the 196 acres of land owned by the company. A large fleet of Monx tank cars is in daily service supplying consuming industries in the valley with their requirements. Over 1,300 people are employed at the combined plants in St. Louis, Monsanto, U.S.A., and Ruabon, North Wales. Plant which is now being installed at St. Louis to manufacture sulphuric acid by the company's new process will ultimately have a capacity of 100,000 tons annually.

Operations in Wales

In 1920 the Monsanto Company acquired a half interest in the Graesser Monsanto Chemical Works, Ltd., which operates plant at Ruabon, North Wales. In November, 1928, the company acquired the remaining half interest, and is spending some thousands of pounds in modernising the plant to effect economies in operation and to increase production.

Under Mr. Queeny's management all the British business is centralised and controlled from new offices in King William Street House, Arthur Street, London. Following his policy of expansion he bought, since his arrival in London, the plant and interest of K. B. Mavlanker, essential oil and Indian merchant, Yiewsley, Middlesex, for the manufacture of methyl salicylate. Further development led to the absorption of the saccharin business operated by the British Saccharin Manufacturing Co., Baxenden, Lancs., so that the combined resources make the company the largest manufacturer of saccharin in the world. The son of the founder, Mr. Edgar M. Queeny, is now president of the American company.

New Companies Registered

THE BUSSEY CONSTRUCTION CO., LTD., Dorland House, Regent Street, London, S.W.1.—Registered as a "private" company on August 9. Nom. cap., £10,000 in £1 shares. The objects are to construct apparatus and machinery of any description and design for treating coal and other carbonaceous materials for the extraction and recovery therefrom of the oil, gas and other volatile hydrocarbon constituents. The directors are the Earl of Verulam, E. Harrison, Lt.-Col. W. H. B. Dampier, A. Powell. The Bussey Coal Distillation Co., Ltd., and Bussey International, Ltd., may, whilst they hold 2,500 shares respectively, appoint one-half of the directors.

BUSSEY MARKETING CO., LTD., was also registered as a "private" company on August 9. Nom. cap., £10,000 in £1 shares. The objects are to carry on the business of coal and coke merchants, dealers in coal, coke, patent and smokeless fuels, oils, gas, dyes, tar, pitch, chemicals and all residual products, and by-products of the carbonisation, distillation and other treatment of coal, etc. Other particulars are similar to Bussey Construction Co., Ltd.

BITUMINOUS COMPOSITIONS (1929), LTD., 107-109, Victoria Street, Grimsby. Registered as a "public" company on August 8. Nom. cap., £50,000 in 40,000 ordinary shares of £1 each and 40,000 deferred shares of 5s. each. The objects are to acquire the business now carried on at Grimsby as "Bituminous Compositions, Ltd.," for £10,300 in cash, and to carry on the business of manufacturers of or dealers in all kinds of graphite oils, paints, bituminous and other waterproofers, road compounds, greases, tallow, cements, powders, polishers, wastes, chemicals and chemical substances; carriers, contractors, wharfingers, store keepers, shipping and freight agents, etc. The directors are F. W. Gough C. H. Grimshaw H. S. Bloomer, T. L. Goulton, E. C. Grant.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[*NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.*]

ALLPORT, James, 34, Poynders Road, Clapham Park, metallurgical chemist. (C.C., 17/8/29.) £29 16s. 8d. July 8.

GOLD, Joe, 129, Victoria Park Road, E., wholesale druggist. (C.C., 17/8/29.) £32 9s. 6d. July 3.

HEWITT AND SON, 373, Brixton Road, S.W., wholesale chemists. (C.C., 17/8/29.) £16 16s. 6d. July 4.

Mortgages and Charges

[***NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case, the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.***]

BREDA-VISADA, LTD., Littleborough, artificial silk manufacturers. (M., 17/8/29.) Registered July 24, debentures, to Lloyds Bank Ltd., securing all moneys due or to become due to the bank; charged on property near Littleborough, also general charge.

JACKSON (THOMAS S.) AND SONS, LTD., Mitcham, varnish manufacturers. (M., 17/8/29.) Registered August 1, £5,000 debentures, to British Anti-Fouling Composition and Paint Co., Ltd., 65, Fenchurch Street, E.C.; general charge. *£500. February 15, 1928.

SUGAR BEET AND CROP DRIERS, LTD., London, W.C. (M., 17/8/29.) Registered July 20, £20,000 charge, to Coutts and Co., bankers; charged on a deposit of £20,000 in company's name with the chargees by Midland Bank, Ltd., Overseas Branch, under the instructions of Société Spéciale Financière. *£41,323. August 30, 1928.

WHITE (TIMOTHY) (PROPERTY) CO., LTD., London, S.W. (M., 17/8/29.) Registered July 23, £155,000 charge, to Coutts and Co.; charged on properties at Tiverton, etc.

WORCESTER ROYAL PORCELAIN CO., LTD. (M., 17/8/29.) Registered July 25, series of £40,000 debentures, present issue £5,000; general charge. *£65,000. May 11, 1929.

Satisfactions

BLYTH, HEALD AND LANGDALE, LTD., Hull, varnish manufacturers. (M.S., 17/8/29.) Satisfaction registered August 2, £5,000, registered July 12, 1920.

D. AND L. MANUFACTURING CO., LTD., London, E., chemical manufacturers. (M.S., 17/8/29.) Satisfaction registered July 30, £100, part of amount registered April 9, 1923.

London Gazette, &c.

Winding Up Petition

COMMERCIAL OIL CO., LTD. (W.U.P., 17/8/29.) A creditor's petition for winding-up was presented on August 6, and is to be heard at the Royal Courts of Justice, Strand, London, on October 15.

Company Winding Up Voluntarily

INTERMEDIATES AND EXPLOSIVES, LTD. (W.U.V., 17/8/29.) By special resolution, July 15, confirmed July 31. W. Gildon, "Falsgrave," West Avenue, Saltburn-by-the-Sea, appointed as liquidator.

Bankruptcy Information

BARBER, John Edgar, trading as BARBERS, Primrose Hill Works, Pendleton, Lancs, oil soap and disinfectant manufacturer. (R.O., 17/8/29.) Receiving order, August 3. Debtor's petition.